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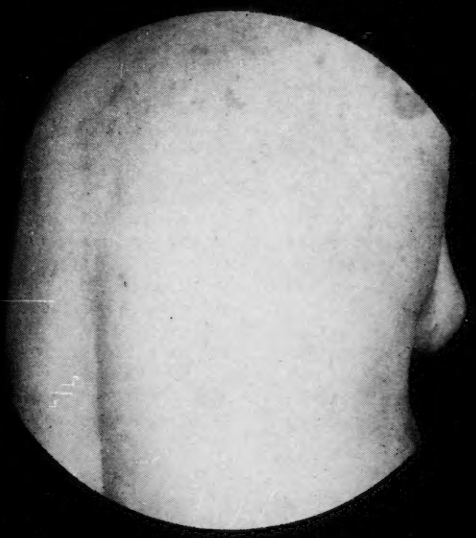

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The Industrial Medical Association was organized in 1915 as the American Association of Industrial Physicians and Surgeons. Its first annual meeting was held the following year. In 1951 the present name was adopted.

The purposes of the organization as stated in the certificate of incorporation (not-for-profit) are:

"The object of this Association will be to foster the study and discussion of the problems peculiar to industrial medicine and surgery; to develop methods adapted to the conservation of health among workers in the industries; to promote a more general understanding of the purposes of the medical care for employees; and to unite into one organization members of the medical profession specializing in industrial medicine and surgery for their mutual advancement in the practice of their profession."

Presently, the membership totals nearly 4000 physicians in the United States, Canada, Latin America, and other parts of the world. Physicians "who have an interest in Industrial Medicine" may apply for membership; specialization in this field is not essential. Regionally, the Industrial Medical Association has 14 Component Societies in the United States. Most Association members carry their membership through one of the component groups.

The Journal of Occupational Medicine, owned and published by the Industrial Medical Association, is sent monthly to each member as one of the advantages of membership.

The annual business meeting and convention is held in the spring. Since 1945, the convention has been held concurrently with the meetings of four other organizations having related interests—American Industrial Hygiene Association, American Conference of Governmental Industrial Hygienists, American Association of Industrial Nurses, Inc., American Association of Industrial Dentists. This combined meeting is known as the Industrial Health Conference.

The Occupational Health Institute, Inc., is a nonprofit educational organization created by the Industrial Medical Association to promote the cause of health in industry. Since 1951, the Occupational Health Institute has conducted the program of evaluation, approval and certification of Medical Services in Industry, on the basis of standards established by the Standards Committee of the Industrial Medical Association. This program was conducted by the American College of Surgeons for many years until its transfer to the Association.

The Association's headquarters office serves as a focal point for the Association's activities, and through its coordination of information regarding industrial health problems encountered throughout the country, it offers invaluable assistance to members on a host of specific subjects.

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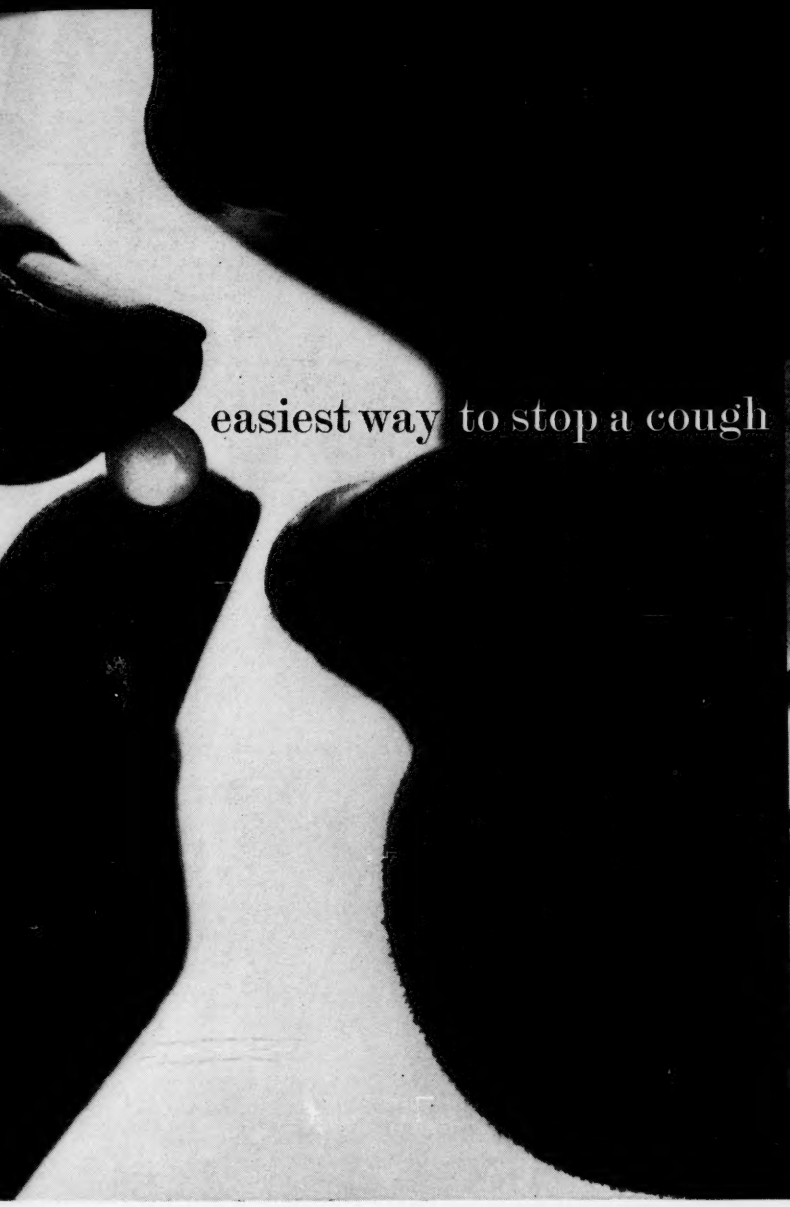

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An important function of the District Counselor is to serve in a liaison capacity with the Component Society of the Industrial Medical Association in his area. The District Counselor also is concerned with regional trends in industrial medical practice and in legislation bearing upon medical service in industry. He is ready to assist any physician with questions or problems.

In promoting the cause of industrial medicine, many District Counselors work with the industrial health committees of their state medical societies, they participate in teaching programs at hospitals or medical schools, and serve as speakers at meetings of groups that express interest in occupational health. Throughout these activities, the District Counselor attempts to stimulate membership in the Industrial Medical Association by acquainting others with the organization's purposes and facilities.

By keeping in close contact with members in his area, the District Counselor gains a familiarity with their work which enables him to make recommendations to the Association's officers and committees regarding those qualified for various positions or honors. He recommends members for committee work, and for fellowship, and recommends fellows for consideration for elective offices in the Association. He also recommends possible recipients for the awards presented at the annual meeting of the Association—the Knudsen Award, the Health Achievement in Industry Award, the Meritorious Service Award and the Merit in Authorship Award.

Many District Counselors also serve as Regional Consultants for the Occupational Health Institute, the educational affiliate of the IMA.

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Association Activities

By-Laws of the Industrial Medical Association

As Revised and Adopted at the Annual Meeting April 29, 1959

Article I—Name

The name and title of this organization shall be INDUSTRIAL MEDICAL ASSOCIATION.

Article II—Object

The object of this Association shall be to foster the study of the problems peculiar to the practice of industrial medicine and surgery, and to unite into one organization members of the medical profession whose interest lies in that field. It shall encourage the development of methods adapted to the conservation and improvement of health among workers, and promote a more general understanding of the purposes and results of the medical care of these workers.

Article III—Membership

SECTION 1—MEMBERSHIP in this Association shall be of six classes: (a) Fellow. (b) Active. (c) Associate. (d) Honorary. (e) Inactive. (f) Retired.

SECTION 2—FELLOWSHIP: Fellows shall be elected from persons who are Active Members and have been actively engaged in the practice of industrial medicine for at least five (5) years.

(a) At least once a year, the District Counselors, with the assistance of the officers of the respective component societies, shall review the roll of Active Members and make recommendations for Fellowship.

(b) Fellowship may be conferred by the Board of Directors upon those active members who have been properly indorsed by the Counselor and/or the president of the component society, and/ a member of the Board of Directors.

(c) The Board of Examiners shall consist of three (3) Fellows appointed by the President with the approval of the Board of Directors. The term of office of the Examiners shall be for a period of three (3) years with one (1) new appointee each year. The Board of Examiners shall evaluate the qualifications of active members proposed for Fellowship and make appropriate recommendations to the Board of Directors.

(d) Qualifications for Fellowship: An Active Member who has achieved distinction in the field of Industrial Medicine is eligible for Fellowship. In addition to the five (5) year requirement, the qualifications for Fellowship shall rest with the Board of Examiners.

(e) The Active Members recommended for Fellowship may be required to appear for examination at a time and place specified by the Board of Examiners in order that proper recommendations may be made to the Board of Directors.

(f) A suitable certificate will be issued by the secretary to those upon whom Fellowship has been conferred. The Board of Directors shall be authorized to make available other desirable insignia of Fellowship.

SECTION 3—ACTIVE MEMBERSHIP: Active Members shall be doctors of medicine who are members of their local County Medical Societies and/or active members of the American Medical Association; or, where the applicant resides in a foreign country, of some corresponding association or society, and who have an interest in Industrial Medicine.

SECTION 4—ASSOCIATE MEMBERSHIP: Associate Members shall be doctors of medicine taking postgraduate work in Industrial Medicine, or interns and residents. The requirement of being a member of their local county medical society and/or of the American Medical Association may be waived for this classification of membership during their training program. Upon completion of their training they will automatically become Active Members provided the above requirements as to membership in their local county medical society and/or the American Association are met.

SECTION 5—HONORARY MEMBERSHIP: Honorary Membership shall be conferred upon those individuals not members of Fellows of the Association who have contributed distinguished service to the objectives for which the Association stands, or have performed some special service for the Association.

SECTION 6—INACTIVE MEMBERSHIP: Inactive Membership status is provided for those Active Members or Fellows who are disabled and therefore must be relieved of some of their responsibilities and obligations. Each case must be acted upon and approved by the Executive Committee, and those approved for Inactive status will be relieved of paying dues for a period of twelve (12) months, during which time they will receive the official publication.

SECTION 7—RETIRED MEMBERSHIP: Fellows and Active Members who have been members of this Association for ten (10) years or more, and who are Fellows or Active Members in good standing at the time of their retirement or are Inactive Members by virtue of disability shall be eligible for Retired Membership. Each case must be acted upon and approved by the Executive Committee.

SECTION 8—Associate, Honorary, Inactive, and Retired Members shall have all the privileges of Active Members, except the privileges of holding office and voting.

SECTION 9—Application for Active or Associate Membership must be made in writing, and the applicant must be certified by the Secretary of the applicant's local County Medical Society as a member in good standing thereof, or submit proof of membership in the American Medical Association, or, in case the applicant resides in a foreign country, submit proof of membership in some corres-

ponding Association or Society. Application must be approved by:

(a) A Fellow or Active Member in good standing, and

(b) The Component Society in the locality in which applicant resides, if there be a Component Society in such locality, and

(c) A majority of the Membership Committee, provided, however, that

(1) In case of a disputed approval by a component society, the applicant has the right of appeal to the Board of Directors of the Association. The requirement of approval may be waived by action of the Board of Directors.

After approval, as aforesaid, the application on such member may be accepted at a meeting of the Board of Directors, at which a quorum is present, by the favorable vote of two-thirds of the Directors present at such meeting.

Fellows and Honorary Members require no prior approval, but may be elected from time to time at a meeting of the Board of Directors at which a quorum is present by the favorable vote of two-thirds of the members present at such meeting.

Article IV—Officers and Directors

SECTION 1—The Officers of the Association shall be a President, a President-Elect, a First Vice-President, a Second Vice-President, a Secretary and a Treasurer.

The President shall hold no other office in this Association.

SECTION 2—The Board of Directors of the Association shall consist of the Officers and Fifteen (15) elected Board members.

SECTION 3—The Officers of the Association shall constitute the Executive Committee of the Board of Directors.

SECTION 4—Only Fellows shall be eligible to serve on the Board of Directors or as Officers. Only Active Members or Fellows will have the right to vote for Officers and Directors.

Article V—Duties of Officers

SECTION 1—The President shall be the chief executive officer of the Association and, subject to the direction of the Board of Directors, shall have general administrative control of its affairs. He shall preside at all meetings of the Members and of the Board of Directors, and of the Executive Committee, and perform such other duties as from time to time may be directed by the Board of Directors. He shall be ex-officio a member of all committees. He shall have general power to execute bonds, deeds, and contracts in the name of the Association and shall have such other duties as may be conferred upon him by law, or these By-Laws, or the Board of Directors.

SECTION 2—The President-Elect shall assume all of the duties of the President in his absence.

SECTION 3—In the absence of the President and the President-Elect, the duties and responsibilities of the office shall devolve upon the First and Second Vice-President, in that order.

SECTION 4—The Secretary shall keep an accurate record of all the transactions of all meetings of the Association and of the Board of Directors and of the Executive Committee, and shall keep a correct list of all Members of the Association and their addresses. He shall be responsible for sending all notices of meetings. He shall be in charge of the Association's seal.

SECTION 5—The Managing Director shall carry on the correspondence of the Association and the other business of the Association as delegated to him by the Board of Directors. He shall receive all moneys belonging to the Association, give a receipt therefor, and turn all money over to the custody of the Treasurer. He shall be paid a yearly salary, the amount to be determined by the Board of Directors.

SECTION 6—The Treasurer shall be the custodian of all moneys of the Association and shall pay all just bills against the Association subject to the approval of the Board of Directors. He shall submit his accounts, audited by a Certified Public Accountant, to the Board of Directors at the Annual Meeting, and shall transmit to his successor in office all funds and property of the Association remaining in his possession. He shall submit an annual report to the Association in such form as may be determined by the Board of Directors.

SECTION 7—Both the Managing Director and the Treasurer shall be bonded in such an amount as shall be determined by the Board of Directors from year to year and in a company approved by the Board of Directors. Expense of the bond shall be borne by the Association.

SECTION 8—The Board of Directors shall be responsible to the Membership of the Association for the administration of the affairs of the Association.

SECTION 9—The Executive Committee shall be responsible to the Board of Directors for the Administration of the affairs of the Association between meetings of the Board of Directors.

Article VI—Meetings of Members

SECTION 1—The Annual Meeting of the Association shall be held at the time and place designated by the Board of Directors.

SECTION 2—Special meetings may be called by the President, with the approval of a majority of the Executive Committee, at such time and place as may be designated in such call. Upon petition bearing the signature of fifty (50) or more Active Members or Fellows, the President shall call a meeting as specified above.

SECTION 3—Members having a right to vote shall be notified by the Managing Director at least thirty (30) days in advance of the date set for the meeting. This notice may be by individual notification or through the official publication.

SECTION 4—Quorum: Fifty (50) Members eligible to vote or represented by proxy shall constitute a quorum.

SECTION 5—The vote of a majority of the Members present in person or represented by proxy, having a right to vote, shall decide any question

brought before such meeting, unless the question is one upon which by express provision of the statutes or of the Certificate of Incorporation or of these By-Laws, a different vote is required, in which case such express provision shall govern and control the decision of such question. Exception to the above provision for a majority vote will occur in the election of contested offices in which the successful candidate will be declared elected on the basis of a plurality vote by those members casting ballots.

SECTION 6—At all meetings of Members, a majority of the Members present in person or by proxy may adjourn the meeting from time to time, but not for a period of more than thirty (30) days at any one time. At any such adjourned meeting, any business may be transacted which might have been transacted at the meeting as originally called. No notice of an adjourned meeting need be given.

Article VII—Meetings of the Board of Directors

SECTION 1—A regular meeting of the Board of Directors shall be held immediately before each annual meeting of the Members. Special meetings of the Board of Directors may be called by the President or by any three (3) Directors at such time and place as shall be designated in the call.

Article VIII—Election of Officers and Directors

SECTION 1—Within sixty (60) days following the annual meeting of the Members, the President shall appoint a Nominating Committee consisting of three (3) Fellows from the Membership at large and three (3) Presidents of Component Societies. The Nominating Committee shall nominate not less than two (2) Fellows for each vacancy on the Board of Directors—five (5) of whom shall be for a term of three (3) years, and shall also make nominations for any vacancies for unexpired terms which may need to be filled.

SECTION 2—The Board of Directors shall nominate one Fellow for each of the offices of President-Elect, First Vice-President, Second Vice-President, Secretary, and Treasurer.

SECTION 3—Any member eligible to vote shall have the right to make a nomination for any office from the floor.

SECTION 4—The Managing Director shall be appointed by the Board of Directors.

SECTION 5—The Nominating Committee shall furnish the Managing Director their nominations at least four (4) weeks prior to the next annual meeting of the Members. The Managing Director shall have ballots printed with the nominations as recommended by the Nominating Committee and the Board of Directors, and space will be allowed on the ballot for write-in votes for each office.

SECTION 6—The President shall appoint Election Tellers from Fellows of the Association, none of whom shall be a candidate for any office.

SECTION 7—At the entrance to the Annual Meeting of the Members, those Members eligible to vote will be presented with a ballot upon the presentation of their paid-up Membership card for the current year.

SECTION 8—The Election will be conducted by the President according to accepted parliamentary practices. The President will not cast a ballot except in case of a tie vote for any office or offices. The results will be announced before the close of the annual meeting.

SECTION 9—At each Annual Meeting there shall be elected to the Board of Directors five (5) Fellows to serve for a term of three (3) years, and other Fellows elected to serve as Directors to fill the unexpired terms when Vacancies arise.

SECTION 10—All Officers and Directors of the Association, regardless of the term for which elected, shall hold office until their successors are elected and qualified.

Article IX—Vacancies

SECTION 1—The President shall have the power to appoint such committees as he may deem necessary to conduct the affairs of the Association properly.

SECTION 2—Other Committees: The President shall appoint such other committees as may from time to time be designated by the Board of Directors.

SECTION 3—Term: All committees shall hold office from the time of their appointment to the close of the Annual Business Meeting.

Article XI—Dues

SECTION 1—The annual dues of Active Members shall be Twenty Dollars ($20.00) per year; of Fellows, Twenty-Five Dollars ($25.00) per year; and of Associate Members, Fifteen Dollars ($15.00) per year. Dues shall be payable in advance on the first day of January of each year. Honorary Members shall pay no dues. Such part of the dues of Component Society Members may be allotted to the respective Component Societies as may be from time to time determined by the Board of Directors.

SECTION 2—Any Member whose dues for a current year are unpaid by April 30 may be considered delinquent and may be automatically dropped from Membership.

SECTION 3—Any Member dropped for non-payment of dues may be reinstated at any time previous to the convening of the Annual Meeting of the year following his delinquency by payment of dues in arrears and also dues for the current year.

Article XII—Component Societies

SECTION 1—The Board of Directors shall have the power to take the necessary steps for organizing or admitting Component Societies.

SECTION 2—A local or regional organization of Industrial Physicians and Surgeons already established by virtue of geographical location, mutual interests, and other necessary considerations, may become a Component Society and its Members admitted to Membership in this Association by making application to the Board of Directors through the District Counselor with a certification from their President and Secretary that their members meet all of the requirements for Membership. Dues

per Member for current fiscal year and a copy of Constitution and By-Laws must accompany application.

SECTION 3—It is recommended that all Members carry their Membership through a Component Society when feasible and practical, as outlined in Section 2. A Fellow or a Member may be carried as a Direct Member upon recommendation of the District Counselor or approval by the Board of Directors.

Article XIII—District Counselors

SECTION 1—The President shall appoint District Counselors and instruct them as to their duties and responsibilities.

SECTION 2—The term of office of the District Counselor shall be for one (1) year and shall expire at the close of the Annual Meeting.

Article XIV—Expulsion

SECTION 1—A Fellow or Member may be expelled for such cause as the Board of Directors may deem sufficient; provided that a copy of the charge made against him shall be furnished to him in writing at least thirty (30) days before the meeting at which such action is taken. A three-fourths vote of all Members of the Board of Directors expressed in meeting of the Board or in writing shall be required to expel a Member of the Association.

Article XV—Amendments

SECTION 1—These By-Laws may be amended by a two-thirds vote of the Members entitled to vote, present in person or by proxy, at any Annual Meeting of the Association; provided that notice of proposed amendments (in addition to the notice required by these By-Laws for such meeting) must be given by publication in the Official Journal of the Association at least thirty (30) days before the date set for the meeting.

SECTION 2—When a majority of the Board of Directors or two thirds of the Executive Committee have certified in writing delivered to the Secretary that the holding of any Annual Meeting is inadvisable, such Annual Meeting shall not be held. In such case, the Board of Directors may submit by mail to the Members of the Association having the right to vote, any question or action, including amendment of these By-Laws, but not including any question or action required by statute, or the Certification of Incorporation, to be taken at a meeting. Such submission shall be made by ballots mailed to each Fellow and Active Member setting forth the action proposed and, in case of election of Directors and Officers, the names of the persons nominated. Only ballots returned within thirty (30) days after the mailing thereof shall be counted. In case of any proposed action, if a majority of the ballots is in favor thereof, such action shall be considered as adopted by the Members the same as if adopted at the Annual Meeting of the Members. The Directors and Officers receiving the majority vote on such ballots, whether or not those nominated, shall be deemed elected to the same effect as if elected at the Annual Meeting of the Members.

Article XVI—Miscellaneous

SECTION 1—Seal: The corporate seal shall have inscribed on it the name of the Association and the words "Corporate Seal, Illinois."

SECTION 2—The Fiscal year of the Association shall be from September 1 to August 31.

SECTION 3—Checks, etc.: No person shall have authority to sign checks, drafts or orders for the payment of money, or notes or acceptances unless specifically authorized by resolution by the Board of Directors.

SECTION 4—Notice: Except as otherwise provided by statute, notice when required to be given to any Director, Officer, or Member, shall not be construed to be personal notice or notice in any particular manner, but such notice may be given either by personal delivery to the Director, Officer, or Member, or by depositing the same in the United States Post Office or letter-box, in a postpaid, sealed wrapper, addressed to such Director, Officer, or Member at such address as appears on the books of the Association, or, in default of other address, to such person with no other address than Chicago, Illinois. Notice shall be deemed to be given when and if mailed. All notices must be in writing, but may be typewritten or printed in whole or in part.

Any Member, Director, or Officer may waive in writing any notice to be given to him under these By-Laws or by law, unless, counsel of the Association states that the waiver of any such notice required by law is, in his opinion, illegal. The President may give the duty and power of serving any notice or notices required by law or by the By-Laws of this Association to any person, and such notice shall be of the same force and effect as if served by the Officer or Officers designed by statute or by these By-Laws, provided that should the laws of the State of Illinois require the service of notice by any specific Officer, such notice must be served by that Officer. Such action shall not render ineffective any notice served by any Officer pursuant to law or the By-Laws of the Association.

ANNOUNCEMENT

Applications are being solicited for Scientific Exhibits for the 1960 Industrial Health Conference which will be held in Rochester, New York. Exhibits will be shown from April 26 through April 28. Application blanks and information may be obtained from George A. Hardie, M.D., Chairman of Scientific Exhibits Committee, 343 State Street, Rochester 4, New York.

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Journal of Occupational Medicine

LABOR HEALTH PLANS and the Industrial Physician

Asa Barnes, M.D., M.P.H., Louisville, Kentucky

THE ECONOMICS of medicine has been greatly affected by this country's change from a predominantly rural, agricultural to an urban, industrial society. The years have seen changing disease patterns, technical advances in medical care, and a widespread application of the insurance principle in providing payment for medical care. One of the most important occurrences in the industrial life of our nation was a ruling by the courts in 1949, to the effect that so-called fringe benefits were subject to negotiation between the employer and the employee and could be granted in lieu of increases in wages.

Within the next 5 to 10 years "health benefits" will be a top priority collective bargaining issue in one of the major labor-management bargaining sessions. When this occurs, labor-management health programs throughout the country will begin to assume a more uniform pattern. In the meantime, the existing plans will continue to vary widely in their solutions to medical cost problems.

Organized labor's health goal is relatively simple. Labor wants comprehensive medical care on a prepaid basis, at a cost within everyone's reach, for every worker and his family. As used here, comprehensive medical care aims at the prevention of illness, the care and relief of sickness, and the promotion of physical, mental, and social health of the individual laboring man and his family. Labor is primarily interested in securing service benefits rather than indemnity insurance to pay the cost of illness.

Why have labor organizations concerned themselves with the problem of adequate health services? Today's worker is dependent upon his health for his wage earning ability. He is increasingly aware that comprehensive and carefully coordinated medical service are prerequisites to the participants in the full benefits of modern scientific care. The practice of medicine has been profoundly affected by changing disease patterns, technical advances in medical care, and progress in medical science. Changes in medical science have made adequate hospital facilities a necessity and require that a practicing physician have easy access to laboratory and consultation service if he is to take proper care of his patients. Attention to proper organization and quality of medical care has become as important as financing.

Since the earliest days of our history, people have joined together for the pooling of funds to meet the cost of unexpected illness or injury. Fraternal and mutual benefit societies had a very early beginning. Commercial insurance entered the field a relatively short time ago. Blue Cross-Blue Shield and various direct service plans have even more recently spread across the nation. The rapid growth of these volunteer insurance plans is the best demonstration of the need that exists for modification of the individual fee payment system. This rapid growth is due in a large measure to enrollment of labor groups.

Many of the health and welfare plans have taken the easy path that has led to the pur-

Dr. Barnes is Area Medical Administrator, United Mine Workers of America, Louisville, Ky.

chase of existing commercial and Blue Cross-Blue Shield insurance plans to protect their beneficiaries. Therefore, the vast majority of workers today have typical hospital-surgical indemnity policies. Under these policies they have the problem of limited coverage for themselves and for their dependents. With higher medical and hospital costs have come higher premiums or reduction in benefits. Some physicians, unfortunately, seem to look on insurance as ability to pay and have taken advantage of it to raise their fees.

Considerable education is needed by labor groups as to the benefits available under their plans. A recent survey has shown about 40% of one group received inferior care because of lack of understanding how to select a physician. Some unions have purchased coverage through local direct service plans, such as the Kaiser Health Plan or the Health Insurance Plan of Greater New York. Others have supported their own health facilities and have set up union health centers. These centers have made a deep impression on the entire labor movement.

With a greater demand for service benefits, management is becoming more concerned with the factors that affect the cost of health benefits and is asking how more effective and efficient use of management and labor-management administered medical care funds can be secured. Management has long recognized the value of a healthy work force in increasing efficiency and keeping absenteeism at a minimum and is willing to help secure good medical care for employees. One has only to look at a financial statement of one of our large corporations to see that, owing to the tax structure of this country, it is more expedient for management to purchase medical care for an employee and his family than to increase wages sufficient for the individual to purchase it. This was illustrated recently by the director of personnel relations of a large corporation, who stated that his company could purchase one dollar's worth of medical care for its employees before taxes at a cost to the company of only fifty-six cents, since it would be a part of the cost of doing business and the other forty-four cents would have been lost to them in taxes. If the employee was expected to purchase the same dollar's worth of medical care out of his wages the company must add a dollar and a quarter to his pay envelope as the employee must pay the quarter in income tax. In our highly competitive industrial society all cost must be considered as a part of the cost of production and added to the selling price of the product. With those costs less than half when management foots the bill, one good reason for management's increasing interest becomes apparent.

The industrial physician, in order to fulfill his role as an advisor to management in medical matters, must keep up with developments in the medical care field. The industrial physician should be prepared to assume a position as a liaison officer between medicine and labor in assisting them in understanding each other. Medical care programs must be given a chance to develop along ethical lines. No problem can be solved well if those most competent to advise refuse to participate in the solution.

Dr. Barnes address is 310 W. Liberty St., Louisville 2, Ky.

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Labor's Health Goals

William A. Sawyer, M.D., Rochester, N. Y.

FOR MANY years as a medical director in industry, I had the good fortune to supervise and apply medical care for workers in industry. For the past six years, as Medical Consultant to the International Association of Machinists, I have had the equally interesting good fortune to interpret and encourage medical care for union members. These two roles are in a sense two sides of the same coin—good health for the worker and his family—one occupational medical care, the other nonoccupational medical care. In both experiences I have regarded myself chiefly as counselor and educator. In both roles, while largely concerned with the medical aspects of health, I have nevertheless had to give a great deal of attention also to the economic, psychological, and social aspects of health. I am sure that any doctor in industry senses the implications here. Generally, practicing physicians are so engrossed with diagnosis and therapy that they are unable to keep abreast of some of the changes taking place in the socio-economic aspects of medical care.

Labor's health goal is quite simple, though it is not simply achieved. Labor wants comprehensive medical care on a prepaid basis. For the most part it has had to settle on compromises and variations of this goal. But any appraisal of most of the limited programs resulting from these compromises seems only to point up the importance and validity of continuing to seek the total goal: comprehensive medical care on a prepaid basis. Actually, this goal contains two separate but parallel desires: one concerned with the *content* and *quality* of a health program; the other with the method of *financing* it. And any analysis of this goal cannot help raising several questions. Is comprehensive medical care desirable and feasible? Is prepayment of medical care desirable and feasible? Can such a concept be related to the present practice of medicine or must it adopt new forms of its own?

I use the word "labor" here as though it were one voice. It is not, of course. It is many voices, in many places with many different experiences. It represents communities with very different kinds of medical care available. It represents people with very different degrees of knowledge in the matter, with different needs, with different emphasis in their expression of these needs but with a common goal of comprehensive medical care of good quality.

Today I should like briefly to (1) examine this goal; (2) describe some of the experiences which have been had in seeking it; (3) tell something of the controversies and misunderstandings which have arisen in connection with it; and (4) discuss briefly the ways in which industrial medicine is or might be related to labor's concerns with health.

Throughout the discussion I should like to keep one word clearly in mind: *prevention*. Preventive medicine, I believe, should become the basis of any health goal. It should be—but rarely is—the first kind of medical care sought by individuals, or the first kind of care provided by physicians. Preventive medicine is the keystone of industrial medical care, whether we are talking about labor's interest in the matter or not. For those of us who are in industrial medicine, this philosophy and fact of preventive medicine is an integral part of our work, and over the years it has come to be both accepted and expected by management and labor alike. The important thing now for the worker and his family is that this philosophy and fact of preventive medicine become an integral part of his total personal health program, i.e., his medical care outside of the place he works, as well as on the job.

As you know, "comprehensive medical care" includes three distinct but interrelated stages of health maintenance: The *first* stage is prevention; the *second* is early diagnosis and treatment; the *third* is rehabilitation and return to

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Dr. Sawyer is Medical Consultant, International Association of Machinists.

Read in the symposium on Medical Care of Industrial Workers at the Forty-Third Annual Meeting of the Industrial Medical Association, Atlantic City, N. J., April 22, 1958.

productive employment. Labor has been educating itself with respect to medical care and is learning the value of seeking this three-stage concept of comprehensive care. Unfortunately, 97% of union nonoccupational medical care coverage is provided by commercial insurance, Blue Cross, and Blue Shield programs, which are concerned only with the second stage of medical care, *diagnosis and treatment*, and which have little or nothing to do with the first stage, preventive medicine, nor the third stage, rehabilitation.

Mr. Al Hayes, President of the International Association of Machinists, expressed this principle well in his address before the 1955 convention of the American Hospital Association[1]:

"We are told . . . that in the next twelve months one out of every three families will need hospitalization for one of its members . . . Granted the truth of the figures—which are appalling—shouldn't we ask ourselves this question: How many of those people who will need hospitalization could have been kept out of the hospitals by preventive medicine or early diagnosis and treatment?

"And that is exactly the kind of question we have been avoiding all along the line in our fragmentized, cart-before-the-horse approach to health insurance. It is high time, I believe, that we stopped emphasizing insurance against the high cost of neglected health, and devoted more of our efforts to developing a system of insurance or prepayment which will give the American people greater access to the kind of health care which prevents illness or nips it in the bud.

"What Labor wants first in a health insurance plan is that it be comprehensive, running the gamut from periodic physical check-ups to care for long term or catastrophic illness. A plan which creates the incentive to keep well and which encourages health education, periodical check-ups, early diagnosis, and treatment."

Mr. George Meany, President of the AFL-CIO, puts a similar thought a little more tersely[2]:

"A medical care program that begins to operate only when the patient is flat on his back in the hospital is a program of poor quality, yet that is the only kind that medical societies and hospital associations have, of their own volition, offered to the public."

Comprehensive care, then, is a large part of labor's health goal. The second part is that it be financed on a prepaid basis. Prepayment has come to be an effective and acceptable technique for the purchase of health insurance. If "health insurance" were synonymous with "comprehensive medical care," the problem would be solved. The fact is that they are two very different things. The commercial insurance companies and the Blue Cross and Blue Shield programs have made phenomenal and important progress during the past decade in providing the American public with the financial arrangements for handling certain of its medical needs. But, while 97% of the medical care coverage is provided in these programs, the benefits actually pay for only one-fourth of the actual medical costs. The economic problem which labor is facing, then, and which is shared by most of our American families whether connected with a union program or not, is how to meet the other three-fourths of the medical costs on a predictable, prepaid basis. Individual medical costs can never be predicted; group medical costs can be predicted —and the larger the group, the more accurate the predictions can be. Enough experience has been had to warrant this statement.

This is a problem for everyone to tackle. It needs a sharing of opinions, experiences, and facts, by everyone concerned: by the medical profession, who renders the service and is thereby paid for it; by the consumer, who needs the service; by whatever third-party representatives may be involved, be they labor, management, commerical, or community interests. Without such a full approach to the problem, we find ourselves in constant and sometimes heated debate over one facet of the problem without any appreciation of its entirety.

There seems to be no real question as to the *desirability* of comprehensive medical care. The large question is in relation to the financing of it. It seems to me that there are only two possible ways of doing this: either through large personal wealth, of sufficient size to encompass the unknown on a *postpayment* basis; or through large collective wealth, also of sufficient size to encompass the unknown on a *prepayment share-the-risk* basis. Labor unions are in a position of having obtained this large collective wealth, through negotiation with management as a fringe benefit of the union agreements, and are in the second position of wondering how to use this collective wealth so as to obtain the best in quality and in scope of medical care for their members and their dependents. Collective wealth, prepayment, share-the-risk—this is the substance of any insurance program, of course, whether it is life insurance, automobile insurance, fire insurance, health insurance. What labor has come to wonder is whether this program—collective wealth, prepayment, and share-the-risk—might provide something other than insurance, something better and broader and more meaningful in the way of medical care. And this has led us to the variety of labor health programs now in existence.

Let us look at some of the ways in which these prepaid health funds are now being spent. Most of the funds are going for commercial health insurance, Blue Cross, and Blue Shield, in spite of their limitations. Here we come to a weakness in the pursuit of labor's health goals. Insurance has little to do with a regular program of comprehensive medical care. All it can do is to help pay part of the cost of ill health when it develops. This is a far cry from the vision that starts with a desire for comprehensive medical care and includes not only prevention and health education but ends in rehabilitation and return to productive work. Insurance provides coverage for urgent problems of financial need, it is available, and it is generally much simpler to come by. Other funds, however, are going directly for medical care. We should keep in mind the 97% of those covered come under cash reimbursement with occasionally some service by insurance companies, Blue Cross and Blue Shield, while only 3% are covered by direct service in union and community health centers. It is these examples of medical care programs that warrant a further appraisal today. These programs have taken several forms: some are community-sponsored, some are sponsored by management, some by labor, some jointly by management and labor, some by a private federation of physicians. All of them seem to be working well, in spite of the problems they have encountered along the way.

This, then, is something of the picture and the pattern of the impact of labor's health goal in our country. It is a sizable impact, and, as such, has brought forth sizable repercussions from many directions. The thing that is troubling to me, and to labor unions as well, I presume, is that many of these repercussions —whether they appear in a medical journal, a woman's magazine, or the daily newspaper —are often based on a fragment of knowledge about the subject matter, coupled with a large measure of fear and conjecture about the unknown. It would be a great service if these reactions to the impact of labor's interest in health could somehow also be analyzed and shaken down into a common denominator, or several common demoninators, which could be hammered out on a realistic basis with the persons and groups involved.

One of the fears most often expressed is that labor will "take over" the control of medical care in our country. I find this a preposterous thought. But perhaps you would rather hear it expressed by labor itself:

Mr. George Meany, President of the AFL-CIO, has said[2]:

"We have no urge to dictate or to control the practice of medicine, for we know that we are not competent to do so. We want only to help bring into being the kind of programs and facilities that will attract the best doctors and that will bring out the best that is in them. We favor any method of organization and payment that will enable them to practice freely as their professional judgment indicates, with no economic barriers between our members and their services."

And Mr. Nelson Cruikshank, of the AFL-CIO Social Security Department[4]:

"The problems of negotiating in this area require a mutual respect for the professional rights of each party. If labor representatives attempted to dictate matters involving medical practice, doctors would quite justly resent it. They could rightly question the propriety of laymen passing judgment or interfering in an area they correctly deem to be within their own professional competence. But I remind the doctors that theirs is not the only area in which professional competence exists. It was Dr. Alan Gregg, of the Rockefeller Foundation, who once remarked:

> 'Most doctors have for so long been surrounded by sycophantic interns, obsequious nurses, and frightened patients, that they get themselves confused with God!'

It is not the physician's insistence on preserving the jurisdiction of his profession to which labor representatives object. It is when he denies a proper sphere of interest to other professions and to honorable trades and occupations."

All of these departures from orthodox medical care have brought into sharper focus the present day controversial issues between medicine and labor. As the membership in such medical plans increases, and as the influence of these large groups of consumers is felt, these issues are debated more generally and with greater intensity. One of the most hotly debated issues is that of third party participation in the doctor-patient relationship.

Third party interjection may take different forms. It may be individual patient inquisitiveness, group assertiveness, or corporate group responsibility. As administrators of such a corporate group, the officers of a health and welfare plan have a strong obligation to their members. These members have today become health-conscious as never before. They realize the potential power in their combined resources, and they are more and more aware of their ability to purchase good medical care, something they have too seldom had before. In a way, these are deprived people who sense in their group strength an opportunity to obtain the best—something they have long wanted.

One of the oft-stated principles of union health centers is that there must be no interference with the doctors by lay boards or ad-

ministrators or by the union membership. But it is unfortunately true that, wherever medical care is provided, there will always be individuals and groups who will in a sense be annoying to the medical profession. All doctors know that. If, in all third party participation, all eyes could be kept on the patient's needs and on efficiency and quality of care, there would be little difficulty. But in this area, the interpersonal relationships are particularly touchy and troublesome. That such difficulties cannot be overcome is scant tribute to the ingenuity and imagination of fair-minded people, be they doctors or union officials.

Now what is the relationship of all this to occupational medicine? Why should you, primarily occupied with in-plant medical service, be concerned with provisions for nonoccupational illness and medical care?

I am sure all of us in the field of occupational health have an interest in the total well-being of the worker and his family. The kind and quality of medical care workers receive in the community influences to a marked degree their health on the job.

Dr. Evarts Graham, of St. Louis, has expressed very well one phase of the benefit of high quality medical care for workers and families. In a fairly recent appraisal of the quality of care in the Labor Health Institute program, this Washington University Professor of Surgery, said[4]:

"The professional care of the patients under the direction of the staff of the Labor Health Institute is of a very high order. When one considers that the average weekly salary of those who are served by LHI is only about fifty dollars per week, it seems almost a miracle that they can obtain such excellent medical service. I must confess that this experience opened my eyes to the advantages of prepaid medical care by a group of physicians, although I was by no means antagonistic to the idea previously."

Actually, the history of the labor movement includes many vital contributions to the nation's health. The struggle for the eight-hour work day, adequate wages, safe and healthful working conditions, control of child labor, restrictions on women's labor, disability and unemployment insurance, old age security, maternity leave—all represent the fundamentals of health protection.

In this tradition, the labor movement accepts a similar responsibility toward the solution of the ever-present over-all medical care problems of its members, which affects the nation as a whole. Many will agree with Dr. Alan Gregg[5]:

"One of the most heartening and significant forces influencing the practice of medicine today is the intelligence and the conviction with which health is being helped by the labor unions."

Those of us who have had any experience with absence due to sickness among workers know how important is the nonoccupational medical care they obtain. Too often in our efforts to return sick employees to work, we have been confronted with inability of sick workers to afford thorough study and adequate treatment of their medical problems. Through many of these 120 union- and community-sponsored centers a better quality of medical care is provided than has been possible before. From that point of view such union efforts should be welcomed and supported by management. In a sense, they are supported by management. Ninety-two per cent of employees are under plans administered solely by employers, 7.5% are under jointly administered plans, while only 0.5% to 1% are covered by union-administered plans. Management pays close to two billion dollars yearly for health insurance. This raises the question: Will there be an increasing interest and concern by management about the medical care which their employees receive outside of the plant? Certainly, good health is to the benefit of better production.

Availability of early diagnosis with adequate treatment to all workers should make for less sick absence and less hospitalization. There are figures available to show that comprehensive care through group practice can markedly reduce hospital requirements. Dr. Frederick D. Mott, in his paper before the Economic Club of Detroit, summed this up very well.[6] There is much more that could be said as regards industry's interest in some of labor's efforts to find better medical care, but time is limited. These remarks about such matters are made to indicate how far-reaching may be labor's interest in better forms of medical care. We need to think about these things.

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You're in Business—Big Business

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THE TITLE of this paper is deliberate. A few short years ago the use of such a title before a representative group of the medical profession would have been extremely provocative if not downright insulting. It may still be distasteful to some, and to those I apologize.

I am sure that most of us are aware of the fact that recent developments, over which we have had little or no control, have completely altered the practice of medicine insofar as administrative procedures are concerned. Group health insurance has become so thoroughly indoctrinated in the minds of the American public that it now holds a prominent place in the family budget and in the deduction columns of the worker's paycheck. Like it or not, at this stage of the game there is little we can do about it. As a profession I think we must accept it, but let's keep it under control to the best of our ability.

What has brought about the tremendous growth in group accident and health insurance in such a relatively short time?

The first group insurance plan was a life insurance program inaugurated by Sears Roebuck and Company for its employees in 1911. The first hospitalization insurance program originated in 1932, when the Blue Cross Plan was approved by the American Hospital Association. The commercial insurance companies followed with their various hospital plans in 1934. Surgical insurance, a natural outgrowth of hospitalization coverage, was started by the insurance companies in 1936. Since then, practically every conceivable type of health insurance has become available.

The growth of these plans was quite modest until the early years of World War II, when our entire economy was geared to the armament program. Wages and prices were frozen. Increases to Labor were limited to the so-called "fringe benefits"; and these became the primary goal at the bargaining table, where they continue to be a subject of major interest. Business at that time was excellent, supported indirectly by the government through cost-plus contracts. Not only did benefits increase rapidly for those originally covered, but the plans continued to grow, covering more and more people until at present approximately 75% of our population are covered by some form of health insurance.

The expenditures for medical care in America today are astounding. The following figures are quoted from a September, 1958, issue of *Medical Economics*. "The American physician is part of a 15 billion dollar a year enterprise; he provides medical services for which people now pay $3,693,000,000 a year and in addition thru charity and uncollected bills gives away another billion dollars worth." The article further breaks down medical expenditures into several categories, the total of which is substantially $15,000,000,000. "This figure represents more than the American people spend annually for new and used cars. It is more than we spend annually for brokerage, banking, legal, lending and life insurance services combined." Contrast this $15,000,000,000 figure with those for 1923, when our expenditures for over-all medical services approximated only $1,000,000,000 annually.

Since American industry today employs over 60,000,000,000 persons, management and labor directly or indirectly contribute much toward this huge expenditure. Labor has come to expect that management shall provide all, or at least a large portion, of the cost of medical care. Initially these demands were associated with occupationally caused disabilities, later for limited coverage for nonoccupational conditions, and most recently for comprehensive nonoccupational medical care and hospitalization. Some companies go even further and provide leave of absence pay during illness in addition to medical and hospital costs.

The Research Council for Economic Security

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has recently reported the results of a five-year study costing more than $250,000 and covering approximately 200,000 employees in 145 plants, ranging in size from 500 to more than 5,000 workers. The study, thus based on a statistically meaningful sample, came up with two main conclusions: (1) $2,000,000,000 a year in production time is lost by private industry because of prolonged illness of workers with subsequent absence from their jobs, and (2) nonoccupational illness costs employees 13% of their annual income—a total of $800,000,000 in lost wages, plus some personal medical expense.

Industry and the insurance companies have had long experience in compensation insurance; so fairly accurate predictions can be made relative to losses, and it has been possible to establish uniform premiums. The premium rates for compensation insurance are regulated by the insurance department of each state. Each industry is classified according to the frequency and severity rates of the various risks involved. Thus a heavy industry or one with a high potential of accidental injury or occupational disease is rated much higher than a light industry or one with low potentials. Foundries, chemical plants, woodworking shops, paper mills, tanneries, and department stores have different rates. These basic rates are established by the state at so much per one hundred dollars of payroll. The specific rate for any industry is established by dividing the payroll by the amount of losses, which gives what the insurance company terms "pure premium." An expense factor is added to this which establishes the actual premium. These rates, however, are subject to revision, either upward or downward, depending upon individual plant experience. A plant with a high loss ratio can be assessed a higher rate, while one with a good loss ratio receives a reduction in premium. In short, business, large or small, pays for its own industrial injuries and occupational disease in direct ratio to actual cost, a circumstance which has served as a catalyst for the development and improvement of industrial medical and safety programs.

Since nonoccupational health insurance is relatively new, no fixed formula has been developed for underwriting purposes, and it will probably be a long time before such a formula can be established for this type of insurance. There are too many variables and changing conditions. However, some means must be utilized by the underwriters to determine the risk potential in order to quote a price equitable to the risk involved. The factors used for this purpose include size of risk, or number of employees to be covered; geographical location; medical and hospital facilities available; median age level of the employee group; average income; and percentage of women in the insured group. These have considerable bearing upon cost and therefore are helpful in discussing premium rates.

Approximately 85% of all group health insurance contracts are now written on an experience rating plan, in other words, on a cost-plus basis. At the end of the policy year all payments made under the contract are totaled, and an amount is added which provides for the administrative expense for the insurance carrier. The sum of these two items, plus a small contribution to surplus, establishes the annual premium for any particular year. It is as simple as that.

The cost of these insurance programs has been growing steadily year by year, and it is this constant and continual increase in cost that concerns management. At a recent meeting in New York, Dr. R. E. Trussel, DeLamar Professor of Medicine at Columbia University, stated that hospitalization costs have increased 258% since 1946 and in some situations medical costs seem uncontrollable. It has been estimated that hospital costs will continue to increase 5% annually for an indefinite future. As these costs rise, they are passed on to the ultimate purchaser. When costs reach a certain point they can become catastrophic, and, if this happens, we all know the end result. We have seen it develop on all sides; in Europe, Canada, South America, and the Orient.

The American Hospital Association states that 22,089,719 Americans were admitted to hospitals in 1956. The average length of stay in short-term hospitals has over the years decreased markedly—from 40 days in 1900, to 14 days in 1945, and to 7.7 days in 1956. The reason for this decrease is obvious. In 1900, hospitals were utilized primarily for severely ill patients, while today they are utilized for all types of cases and from all segments of our population. The great advances in effective therapy and the use of hospitals for certain diagnostic procedures have also had their effect in reducing the average hospital stay. On the other hand, expense per patient per day increased from $10.04 in 1947 to $24.99 in 1956 and the average cost per hospital stay more than doubled over the same period—from $88.35 in 1946 to $186.43 in 1956.

Comprehensive medical care and hospitalization insurance, so-called major medical insurance, is by far the fastest-growing item in the casualty insurance field. Some indication of its tremendous growth is evidenced by the

following figures. In 1952, a total of 689,000 persons were covered by this type of insurance; in 1955, there were 5,250,000 persons covered; and as of June 1957, more than 10,000,000 persons were covered. Additional growth in this field is indicated by the fact that in 1952 only 24 insurance companies were writing major medical coverage, whereas in 1957 this number had increased to 131 companies.

Contrary to other types of group insurance, major medical has no set pattern as to coverage; variations in amounts, etc. are limited to the purchaser's desires. However, such policies contain four distinct features: (1) They carry a maximum limit on benefits, usually ranging from $2,500 to $10,000. (2) They carry a deductible provision, ranging from $25 to $500. This feature eliminates small nuisance claims and thus reduces expense. (3) They include a co-insurance clause which provides that the recipient of benefits assume a portion of the expense of each illness. This co-insurance feature usually amounts to 20% to 25%. (4) Most major medical policies contain no maximum fee schedules. Since this type of insurance is primarily for catastrophic or long-drawn-out illness it would be impractical to establish uniform fee schedules. But these policies do state that service must be necessary and fees reasonable for the type of service provided, in accordance with the specialty and geographical area concerned. These difficulties are recognized by the medical profession, and some local societies have established "grievance committees" to arbitrate specific cases. This procedure has been approved by the American Medical Association.

In the commonwealth of Massachusetts it has been estimated that Blue Cross-Blue Shield subscribers could save 8 to 10 million dollars a year if the average hospital stay per patient were reduced by only one day and if 1 out of every 50 patients were treated at home instead in the hospital.

Another facet of medical care that needs exploration is the use of separate facilities, such as nursing or convalescent homes, for the care of the aged and chronically ill. Most of these patients need only custodial care with limited medical attention. Adequate medical care could be provided for them in separate facilities at far less cost, at the same time freeing hospital space urgently needed for the more acutely ill.

Our profession and the insurance companies both have a tremendous stake in the private practice of medicine. If the various forms of prepayment plans now in existence do not meet the requirements of the public, I think it is only a matter of time before some type of governmental control is forced upon us.

My company, Liberty Mutual, for many years has been very active in the field of industrial medicine—first, in the field of workmen's compensation and rehabiliation, and more recently in group health insurance. We believe that what has served well to reduce costs in the former should have a salutory effect upon major medical costs as well. In all plants of sufficient size we recommend the establishment of an in-plant medical service, either full-time or part-time, depending upon the size of the plant population and the severity of specific occupational exposures. While these programs do include the care of minor occupational injuries, they are primarily oriented to preventive medicine. We also recommend that the plant set up a good medical examination program including both preplacement and periodic examinations, designed chiefly to provide a health inventory of the employed group, for the purposes of picking up early deviations from the norm, followed by referral to the family physician or the specialist for additional work-up and corrective therapy. Good follow-up is essential.

Summary

In the comparatively short period of 25 years, more than 125,000,000 persons have availed themselves of some type of protection from economic loss due to illness. Much of this economic burden is borne by industry through health and welfare benefits. Since more than 75% of our population is now covered by some form of health insurance, the medical profession has become greatly involved and has a great stake in the successful operation of insurance plans. Success depends to a great extent upon cost, and therefore control of cost becomes extremely important.

Most health insurance plans today are sold on an experience-rated basis, the policy holder paying a premium in accordance with his specific loss ratio, and therefore industry is greatly concerned with loss-control measures. While there are a few instances of flagrant abuses and excessive charges, the greatest difficulties from a control viewpoint are prolonged hospitalization for minor illness and chronic disease.

In-plant medical programs with a primary interest in preventive medicine can do much to control cost. Proper placement and periodic medical examinations designed primarily for health maintenance offer much through early diagnosis and referral for proper treatment.

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Windsor Medical Services, Inc.

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IN AN address before the Colorado State Medical Society on Sept. 5, 1956, Dr. William Sawyer[1] commented as follows: "Labor's health goal is simply this: comprehensive medical care on a prepaid basis . . . labor wants to know that the payment for medical care is complete, not a partial payment toward an unknown sum . . . the Windsor plan is of especial interest to us because of its unique ability to combine a fee for service charge, which many doctors prefer, with a per capita subscriber fee and a medical care program which many patients prefer." The plan referred to, Windsor Medical Services, Inc., is not a labor plan; it is a community plan. As will be shown in the discussion of the scope and coverage of the plan, this distinction is an important one.

Windsor, in the County of Essex, Ontario, is an urban, industrial community situated directly across the river from Detroit. The principal industries in Essex County are automotive—Ford, Chrysler, and General Motors—together with the many and various feeder plants. While the total population in the county is about 250,000, the population in the Windsor Metropolitan Area is approximately 200,000. It is the latter population that comprises the setting for Windsor Medical Services (W.M.S.).

What does W.M.S. offer? Stated most simply, it offers comprehensive physicians' services in the office, home, and hospital to the people of the community. The services are provided by virtually all of the 275 physicians practicing in the area. And for the services included in the plan, the subscribers pay variable monthly premiums according to the structure of the family. For example, the premium for a subscriber, his wife, and two or more children is now $7.90 per month.

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Read at the Forty-Fourth Annual Meeting of the Industrial Medical Association, Chicago, April 29, 1959.

There is a further source of services. Beginning on Jan. 1, 1959, the Ontario Hospital Services Commission provides a complete in-hospital accommodation. This includes a ward bed and all hospital facilities, such as the use of the operating room, delivery room, pathology and x-ray services. For such a family as that described, the hospital facilities are at a cost of $4.20 per month.

The answer, then, to Dr. Sawyer's statement concerning the "health goal" is that comprehensive physicians' services and hospital care are available to this family of four persons at a prepaid cost of $12.10 per month. Of primary interest, however, is the rise and success of W.M.S. and what this phenomenon may mean to the medical profession in Canada and the United States.

It was stated that W.M.S. is not a labor health plan; it is a community plan. To the satisfaction of labor there is no setting-apart, no lines of division that separate, in any medical sense, the people of the community. Today the most striking fact about W.M.S. is that with 170,000 subscribers it embraces about 85% of the people in the Windsor Metropolitan Area.

How did all this happen? The story should not be of minor or passing interest to the medical profession. It is a story of imagination, dedication, and above all, medical statesmanship. Woven through it is the same element that has made medicine great, the element of research.

It was in July, 1939, the W.M.S. signed its first contract for comprehensive physicians' services to the public. The offering culminated one series of events; it introduced another.

Long before 1939 the Essex County Medical Society had become aware that a yeast of dissatisfaction was affecting the future of medicine. Facing future events calmly and with a realistic objectivity, the Society concluded that, in the light of the public's problem of medical care, action to solve the problem,

under either voluntary or government auspices, was inevitable. Subsequent thinking and discussion were devoted to the details of solutions and how they might be applied.

It goes without saying that physicians who practice medicine are not, for that reason alone, experts in the organization and administration of health insurance. About all that could be done was to consider hypothetical situations and define basic principles. To the medical mind a hypothesis is the beginning of research, but in this case there was no "laboratory" to subject the theories to rigid tests. Nevertheless, the basic principles were important; stated long before 1939, they have determined the form and the growth of Windsor Medical Services.

In 1935 a fortuitous event occurred, if the economic depression of the thirties may be so described. Public medical care became a weighty and pressing problem of public welfare. The governmental welfare agencies of Ontario were ill-prepared to solve the problem, and their efforts led to widespread dissatisfaction among the medical profession, the relief recipients, who, at the peak, numbered about half of the population and, for that matter, the agencies themselves. This was the situation that led to an agreement between the Government of Ontario and the Ontario Medical Association whereby the latter accepted the responsibility to organize, administer, and provide medical services to the relief recipients in the province.

The Association assigned the major responsibilities for medical relief administration to the county medical societies. For the Essex County Medical Society, the laboratory in which principles or hypotheses could be tested had been created!

This is not a *post hoc* explanation of something that occurred more than 20 years ago. The reports and the official minutes of the Society's meetings tell a clear story. A report issued by the Society in 1936 urged the Ontario Medical Association to take full advantage of the opportunities for research. Medical relief provided the laboratory; the recommended research was focused on health insurance. As the report stated, "Basically the elements in medical relief and health insurance are the same. There are potential patients, physicians and a central fund of money."[2]

The use of medical relief funds for research in Essex County was vetoed by the Government; it was the Rockefeller Foundation that granted $23,800 for a research program covering 18 months in 1937-1938. The problems selected for study are pertinent to the background of the Windsor Medical Services, Inc.

The research, as must be the way of all research, took little for granted. In this atmosphere of study even the most cherished views and opinions of the profession were subjected to critical analysis. For example, the profession strongly endorsed the principle that people needing medical services should be given the freedom to choose their physicians. Further, the profession held that the physicians providing services should be paid on a basis of fees for the services rendered. But a question remained to be answered: Could an administrative system be devised within which these two principles would function compatibly and with reasonable economy? A complementary problem of free choice raised the question: how free? This was especially important to decisions involving night calls and to the the assumed tendency of patients to "shop around" for medical care. The only way that the principles, problems, or assumptions could be studied was to establish completely free choice, adopt a system of fees-for-services, eliminate all barriers to services, and analyze the results. Other problems dealt with the simplification of paper work and administrative controls. The research period in medical relief overlapped the planning period for W.M.S. The results of a recent and extensive study of the plan have appeared in a recently published book.[3]

Following are the principles under which W.M.S. was inaugurated and, with little change, under which it operates today: (1) Medical Society sponsorship; (2) the provision of comprehensive physicians' services; (3) free choice of physician by subscriber: (4) fee-for-service remuneration to the physician; (5) group enrollment of subscribers; (6) coverage of dependents; (7) broad metropolitan community enrollment.

"Medical society sponsorship" is a phrase that is used in many descriptions of voluntary plans. The sponsorship, however, may range from the dynamic and positive to the merely nominal. The latter is typified by a mild vote of approval, after which the practicing physicians contribute no work and little interest on the assumption that "George will do it." In the case of W.M.S., the first point of distinction is the sponsorship of the Essex County Medical Society. The legal "legislative body" of the plan is made up of those physicans who have agreed to provide services in accordance with the rules or policies adopted by the plan. These are the members of the plan, and this membership includes virtually the total roster of the Essex County Medical Society. In short,

as a legislative body the members formulate the policies having to do with the conditions of membership, fee schedules, controls, and the like, and the members take their role seriously.

The board of directors of W.M.S. is elected by the members. The board is composed of five physicians and two laymen. This is the body that participates more intimately in the operation of the plan. The administrative personnel includes a General Manager and a full-time Medical Director. To house the staff, a new building, constructed and owned by Windsor Medical Services, was occupied at the end of 1958.

"Comprehensive physicians' services" is a broad phrase. In the case of W.M.S. it means, with the exception of psychiatric care, those services that the general practitioners and specialists practicing in the community are capable of providing in offices, homes, and hospitals. As defined in the subscriber's contract the services include (1) diagnosis; (2) medical care during illness of the type usually provided by the medical member chosen; (3) confinements, including prepartum and postpartum care; (4) consultations; (5) surgical services; (6) treatment of fractures and dislocations; (7) x-ray, cystoscopic, and bronchoscopic examinations and diagnostic procedure; (8) administration of anesthetics; (9) preventive medical services, such as inoculations; (10) refractions and preventive medical examinations; and (11) radium and deep x-ray treatment.

Provision is also made whereby the subscriber may obtain services outside the Windsor area.

It is a distinctive feature of W.M.S. that it does not resort to "deductibles" whereby the patient pays a portion of the costs of specified services. Nor are there any arbitrary limitations on the services his premium has purchased. With virtually all of the practicing physicians as members of the plan, the principle of free choice has real meaning. And in a service plan of this type the need of the patient is the primary consideration.

The literature of health insurance contains numberless references to the issue of "extra billing." The issue has its origin in the sliding scale of fees, the traditional theory of physician's charges for services. The validity of the theory under modern conditions of services and needs is not a subject of this paper. The problem of extra billing is where to draw the line of subscriber income, below which the premium will pay the full costs of services. In W.M.S. the line is drawn at an annual family income of $6,500. Within this limit there is no extra billing; beyond it the physician retains the privilege of charging extra. As is known to those acquainted with population income in industrial areas in the U.S.A. and Canada, the limit of $6,500 is high enough to include about 90% of the population. Significant also is the fact that the physicians place little emphasis on the privilege of extra billing.

In all of the foregoing it is not implied that Windsor is peopled by idealists and that all of the practicing physicians are archangels. Controls are necessary, and here, too, the general literature of health insurance is filled with pleas and exhortations to "be reasonable." The controls exercised by the administrators of the plan and the Board of Directors are recognized as short of perfection and are undergoing continuing review. But the most valuable feature of any system of control exists in Windsor. That feature is the support given to the system by an overwhelming percentage of the practicing physicians.

W.M.S. is a prepayment plan, a demonstration and a laboratory. As a laboratory its findings deal with many of the crucial problems before the medical profession today. For example, the question "what type of protection does the public want?" is almost as pertinent today as it was when first asked by the profession, over 20 years ago. And major policy decisions depend on the answer.

The slow growth of W.M.S. during its earlier years was a matter of concern to the Board of Directors. It could have been reasoned that this was normal because the plan was new. Or, the profession could have taken the position that, having met its responsibility and offered the plan, it was up to the public to take it or leave it. W.M.S. took neither position; it engaged in what, today, would be called "market research." In this case the "product" was comprehensive physicians' services; was this the product that the public wanted?

Elsewhere in Canada and especially in the United States health insurance plans were developing. None offered comprehensive physicians' services to the public; the plans were limited to such specialized services as surgery and obstetrics. W.M.S. asked: is this what the public wants? The question could only be answered by offering a limited service plan, and this was done in 1945. In effect, therefore, the offering of the two types of plans took the subject out of the realm of endless theory and debate and moved it into the area of research. The test lay in the public's response.

The record is now a clear one. In 1945, when the limited plan costing one-third as much as the comprehensive plan was offered, the comprehensive plan group subscribers numbered 7,656. This was the result of six years effort. During 1945, the year in which it was first offered, the limited plan was chosen by 605 subscribers.

It was in 1946 that the number of subscribers to W.M.S. doubled. The groups that chose the comprehensive plan numbered 15,609 subscribers; those in the limited plan totalled 2,158. The next year, 1947, the subscribers to the limited plan rose to 2,509 but, at the same time, the group-subscribers to the comprehensive plan reached 46,083. Since 1947 the subscribers to the limited plan have decreased; with 170,000 persons now covered in Metropolitan Windsor the limited plan has approximately 1,000 persons. The public has given its answer over the years, and as hard facts.

It may be said that with employers paying all or a large portion of the costs the above results were predictable. But a few facts are also available on this subject. W.M.S. covers the employees of 1,158 firms; for 706 of these groups, large and small, the employers contribute nothing beyond the bookkeeping costs of payroll deductions. For the remaining groups the employers' contributions show a range up to 100%.

There is other evidence of the public's choice. When a subscriber leaves his group he has the privilege of remaining in W.M.S. by paying directly. During the period of the recession the "pay direct" subscribers showed an abrupt increase, exceeding 32,000. And they stayed in the comprehensive plan!

Speaking as a practicing physician and an industrial physician, some general observations concerning W.M.S. and its influence on the community are pertinent.

1. W.M.S. has grown and has become well-established, under the sponsorship of the organized medical profession, as a dynamic medical and social force for community betterment.

2. It is a highly significant fact that the conditions that disturb the relationships between medicine and the public, especially labor and industry, are nonexistent in Windsor.

3. It is theorized that in a free, competitive economy the best product wins. In Windsor the comprehensive plan for physicians' services now faces virtually no competition.

Even so, W.M.S. is not resting on its record; it emphasizes both research and expansion. Recently, on Jan. 1, 1959, the plan was opened to individual subscribers. It was concluded that the earlier rule of covering groups of 10 or more, changed later to groups of 5 or more, left out an appreciable percentage of people who had a need and should be included. The age limit for entering the plan was placed at 70 years. By March 1959, 1,165 more persons were added to W.M.S.; of this 45% are between the ages of 55 and 69. This, at least, is a first approach to one of the critical problems of Canada and the United States, the care of the aged. The collected data on services and costs should be illuminating.

4. The people of Metropolitan Windsor are health-conscious. The plan provides preventive as well as curative services.

The recent poliomyelitis epidemic in neighboring Detroit offers a dramatic case-history in preventive medicine. With the production of Salk vaccine, the local Board of Health administered the preventive treatment to 18,000 school children. The action was in accord with the views and support of the Essex County Medical Society. For those above school age any subscriber is entitled to this service under the comprehensive plan.

Later, the epidemic developed in Detroit, with approximately 900 cases reported. Since there is a constant interchange of population between Detroit and Windsor an epidemic affecting one area would be expected to carry over to its neighbor. Only one case of "polio" was reported in Windsor. While this is no careful epidemiological analysis, it might have been expected that, considering the difference in population and with the same factors present, Windsor would have shown about 90 cases. However, the same factors did not prevail.

5. Industry, collecting the monthly premiums by wage deductions and/or contributing as a fringe benefit, knows that the employee may receive, when required, full physicians' care. The industrial physician may refer any employee to his family physician for medical diagnosis and treatment without concern over the employee's financial position. Preventive medicine in industry is improved; the industrial physician may refer the employee to his physician for a yearly physical examination which may include x-rays of the gastrointestinal tract, electrocardiograms, etc.

6. The Essex County Medical Society, through its members of the plan, with the members electing the Board of Directors has a direct and positive role and interest in the plan's operation. Such important matters as revisions of fee schedules, increases in premiums, the remuneration of the Directors and Officers of W.M.S. all these are subject to the

democratic process of decision. Moreover, W.M.S. has contributed to greater harmony among the members of the County Society. The Directors of the plan are fellow practicing physicians who disseminate information on the workings of the plan and, equally important, are receptive to ideas for improvement and to the solutions of problems before they become issues.

The report previously mentioned,[3] presents the details of W.M.S. in a volume of over 350 pages. It contains an evaluation of the plan based upon the study of the subscribers, the views of the practicing physicians, and the analysis of the data. In the chapter on Conclusions six questions are posed and answered succinctly as "yes" or "no" with a statement in support of each answer. The questions and answers, without the supporting statements, are as follows:

1. Is there a need for comprehensive benefits? Yes.
2. Are physicians' services for home and office care feasible from an actuarial standpoint? Yes.
3. Is the public willing to pay for the increased costs of comprehensive physicians' care? Yes.
4. Is there abuse of services by subscribers? No.
5. Is the physician-patient relationship affected adversely? No.
6. Is the administrative cost of processing low-cost claims so high, in relation to the claims themselves, as to render this type of care uneconomical? No.

The last question has long been of vigorous debate. The detailed analysis shows a processing cost of less than 2.5% of the average claim per month.

This, then, is Windsor Medical Services Incorporated, a health insurance plan created by the medical profession and operated by the medical profession. The practicing physicians give it strong support, and the community welcomes the opportunity to participate as subscribers and beneficiaries.

Conclusions

The place of Windsor Medical Services, as a health insurance plan, is well established. There are no subsidies by government, on either local or federal level.

The plan has operated over a period of 20 years, the number of subscribers is growing, the quality of medicine practiced has improved, the fear of costly illness has been removed from the subscriber, the freedom of the subscriber to choose his physician has retained the competitive spirit among the member doctors, the number of patients a member physician may care for is limited only by his physical stamina and diagnostic acumen.

The physician is paid on a fee-for-service basis, not on a salary.

There is no disturbance of the patient-physician relationship. This relationship has improved as the economic factors have been removed.

The subscriber has retained his dignity as an individual, for he is not receiving something for nothing, but has paid for medical service and has the right to expect quality service.

Dr. Robson's address is 1309 Windermere Rd., Walkerville, Ontario.

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Medical Care Plan of the Endicott Johnson Corporation

Nicholas I. Klimow, M.D., Johnson City, New York

OCCASIONALLY there appears on the horizon a person who combines ambition and ability with exceptional moral sense and a deep respect for his fellow humans. Mr. George F. Johnson, the founder of our company, was one of these. Many years ago he said: "The trouble with most employers is that they don't see far enough ahead. If they did, if they had vision, they would see that they would be better off paying good wages and helping workers lead normal, happy, lives — owning their own homes, being a real part of the community. I believe we could build up a great enterprise by making workers comfortable, free from worry—whether in the factory or home, by thinking of them as human beings, not machines to be run until they broke down and had to be scrapped, to make them as contended as we can within reason." While this statement may sound too idealistic or perhaps paternalistic, the intent of Mr. Johnson was truly an honest desire to help people.

Dr. Willard C. Rappleye, Dean of the Faculty of Medicine, Columbia University, at the conference on Current Problems in Administrative Medicine, May 15, 1952, said: "The health of the people is one of the primary responsibilities of any nation, and is the direct concern of industry and the public, as well as of the medical and public health professions. This problem ranks with such other major features of our national social economy as food supply, housing, employment, industrial production, and Social Security. The American people are convinced of the value of adequate medical services and are detrmined that, in some way, the benefits of modern medicine shall be made available to all."

I am sure that we all have a deep concern and interest in the type of medical care which is to be provided and even a deeper concern as to the way it should be done. Dr. William Sawyer, speaking at the 86th Annual Session of the Colorado State Medical Society, in September, 1956, said: "Labor has taken a very broad view of this scope of medical care. It might be well to repeat at this point what you and I know well to be included in comprehensive medical care: 1—prevention and detection of disease, 2—early diagnosis and treatment, 3 — prolonged care and rehabilitation where necessary and 4—a continuing program of education and counseling for constructive health maintenance. This is what labor wants."

How does the Endicott Johnson Plan fit into this definition? Our program provides complete medical service to approved workers who have been employed six months and to the dependent members of their families, which means nonworking wives and dependent children under 19 years of age.

This service is part of a comprehensive program which serves the general welfare of the worker and his family. It includes such things as pensions, widows' allowances, general relief, loan service, nonoccupational disability and death benefits. The company employs about 18,000 workers, one-third of whom are women. With their dependents we estimate that our total medical service covers about 50,000 individuals. Our company is situated in the southern tier of New York State, nearly equidistant between Syracuse and Scranton, and at the confluence of the Susquehanna and Chenango Rivers. The immediate

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Dr. Klimow is Director, Compensation Bureau, Endicott Johnson Corporation.

Read in the Symposium on Medical Care of Industrial Workers at the Forty-Third Annual of the Industrial Medical Association, Atlantic City, N. J., April 22, 1958.

area is known as the Triple Cities-Binghamton, Johnson City, and Endicott. Our company is the second largest for the manufacture of footwear in the United States.

The company very early in its expansion, realizing the needs of the communities from which its workers came, provided parks, playgrounds, swimming pools, and libraries for the enjoyment of all. They provided funds and land for various church needs regardless of denomination. In addition to this, they built homes for their workers (sold at cost, plus a 3% carrying charge) and paid for by the worker from his salary on a weekly basis. They encouraged and provided garden plots for the employees. These and many more projects were initiated by the Johnson family in the sincere belief that a healthy happy community was bound to prosper. So it was small wonder that out of this desire to help others, a medical plan was the natural outcome.

The plan started quite simply in 1916 (as had comparable plans in many other companies) as a voluntary sick relief association which would pay the worker who was ill and losing time a total of $12.00 per week for a period of 10 weeks. Members paid 25c weekly, while the company matched the funds. One year later, with the passage of the New York State Compensation Law, a doctor and nurse were engaged in the leather processing division in Endicott for the purpose of giving prompt treatment to those who might be injured. These two pioneers also visited the ill employees in their homes. Mr. Johnson, seeing a gradual acceptance of these services, urged the growth of the medical department in the Johnson City and Binghamton areas. So from the very beginning medical care expanded to include the worker and his family. Mr. George F. Johnson often stated that by adopting total medical care he was able to relieve his employees of the worries that often interfered with their adjustment to their jobs or their stability as workers.

As home and clinic care became established, it soon became necessary to provide medical centers in order to house the various type programs proposed by the medical department. The next step was to provide proper and well-equipped hospitals. Again the company provided land and matching funds for the construction of community hospitals. These were outright gifts with no strings attached except that Endicott Johnson employees would be admitted for treatment. The hospital care provided to the employees was unlimited in extent, and every measure was taken to make sure that the best professional care was provided. Mr. George F. Johnson stated at this time: "Large industry with the cooperation of labor should, if possible, operate a full and complete medical department, take care of the health of the workers and the dependent members of their families." Our employees are largely factory, tannery, and rubber workers, who with their dependents are in the same economic and social status and who are in the lower income bracket. They are self-supporting and could bear the cost of ordinary illness for a short period but would find it economically difficult to pay for adequate prolonged medical care. To become eligible, each applicant is required to have a preemployment physical examination. At the expiration of six months, if his work record is satisfactory, he becomes eligible for medical service. However, dependents are not required to have a preliminary physical examination. We have a group-practice type of service, and arrangements to see a physician are much as they would be if one were calling on a private physician, except that the choice is limited to the physicians on our staff.

Medical care is complete and unlimited whether in clinic, home, or hospital. With the exception of 7 full time physicians, the remainder of our 45 staff members work on a part-time basis — that is, the amount of the doctors' time which is necessary to cover the service. The doctors' services are arranged for on a mutually agreeable contract basis. All of the established medical specialties are represented. Cases which are obscure or difficult may be referred to specialists or authorities on special problems located in such metropolitan areas as New York, Baltimore, or Boston. The patient is free to choose any physician on the staff. The general practitioner divides his time between office hours, house calls, and hospital visits. All the doctors take care of the ambulatory patients and serve on the staff of Wilson Memorial Hospital. The members of our group are also members of the county, state, and national medical Societies.

We provide dental care covering preventive type of service, such as cleaning, filling, and extraction. The service is staffed by seven dentists and several assistants and hygienists. There is a podiatry service which includes three doctors of podiatry—one full-time and two part-time. The nursing staff assisting at the clinics comprises a group of 30 graduate nurses, including 4 visiting nurses who also do educational work in the homes and a limited amount of bedside nursing. Clinical laboratories meet the standards of the State Health

Department and are on the approved list. All forms of laboratory determinations are included. One laboratory is in the clinic, and the other is the laboratory in Wilson Memorial Hospital. The roentgenological service is complete for diagnosis and treatment. There are two radiologists in charge, both of whom are certified by their boards. The service is available for both hospital and ambulatory patients. Recently, we acquired the services of a physiatrist to head the department of physical medicine and rehabilitation. All modalities are represented, and he has a staff of six technicians. It is the only service available in the area hospitals and was set up to meet the needs of modern medicine in the field of rehabilitation, early ambulation, and treatment. Drugs and medicines are dispensed from our own pharmacies, without charge, on prescription of the physician, by a personnel of six full-time pharmacists.

Hospitalization is fully covered. Practically all of our patients are referred to the Charles S. Wilson Memorial Hospital, Johnson City, N. Y., a voluntary community hospital with a capacity of 500 beds. The hospital is fully accredited and has been approved for residency training in all the major departments. Our patients are entitled to two, three, or four multiple bedrooms, including all the extra services of the hospital. Private room service and special nursing are also provided when necessary on the recommendation of the patients' physician. The patient may elect to have special services as outlined above by paying the additional charge.

Since 1946 there has been an increasing awareness of mental and emotional disturbances and we have one full-time and one part-time psychiatrist for our clinic patients. The hospital has provided a separate unit of 60 beds for the care of those patients who become emotionally or mentally ill. It is entirely separate from the main hospital and has every facility for the treatment of open ward mental cases. These facilities are also available for Endicott Johnson patients. In addition to these services we have now a cardiovascular surgical clinic as well as a peripheral vascular clinic with modern well-trained personnel who are capable of doing all but the more advanced and experimental surgical procedures.

Beginning in 1946, a department of preventive medicine was also organized. It was the hope that with properly trained medical-social nursing services, many problems could be solved before illness set in, that workers with family problems would obtain necessary advice to help them solve these problems; that by teaching, listening, and helping, we could improve the health standards of our workers and their families. This is a slow process because we have needed to educate our own management and supervision as to the need of the service, the recognition of the cases which could benefit by the service, and then to let the department know where and who these cases are.

What does all this cost? In 1957 the plan cost approximately $150.00 per worker and $67.00 per person eligible. The plan is entirely financed by the company and carried as an operating cost. All of these services which have been mentioned are continued after retirement as part of our pension service. Just this year we have also provided Blue Cross for all our workers who may become ill or injured while traveling, or if after retiring move away from the local community and could not readily return for treatment in our facilities. How is this financed? The cost is an operating cost fixed on each pair of shoes produced by the Company.

I have tried within the limits of my time to give you a picture of the most extensive complete medical care plan in existence in this country. While I believe there are assailable loopholes and weaknesses in such a program, I cannot but feel that our people have found it the most valued of their numerous benefits.

Summary

1. The Endicott Johnson Corporation provides complete medical care to its employees and their dependents. In 1957 this service cost approximately $150.00 per employee, and $67.00 per person eligible for coverage. The total cost is borne by the Corporation.

2. The physician-staff which provides the medical services is composed of seven full-time physicians on salary, who for the most part are general practitioners, and 38-part-time physicians from the community, who for the most part comprise the specialists of the organization.

3. The demand for medical care under this system of unlimited service at no cost to the consumer occasionally causes interference with physicians' decisions as to which patients should receive how much of the available physician time.

4. The program is well liked by the employees who receive its benefits and has caused no serious problem between the corporation's medical staff and the private practitioners of the community.

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The Kaiser Foundation Health Plan and the Company Medical Program

Hallett A. Lewis, M.D., D.Sc., Fontana, California

ONE OF THE most controversial, one of the most praised, one of the most criticized, yet certainly one of the most successful of the medical care phenomena to appear on the American scene is the Kaiser Foundation Health Plan and its allied organizations, the Kaiser Hospitals and Permanente Medical Groups. To put the Kaiser Health Plan into proper perspective and to explain its relationship to our industrial medical program, let's look first at how all of this came about.

The Kaiser Health Plan arose out of industrial medical care provided for certain Kaiser employees. The early Kaiser projects were construction projects located in remote desert and mountain areas where the available medical care was poor and many times nonexistent. In 1933 and 1934, the Kaiser Company was one of six companies engaged in the construction of an aqueduct to bring water from the Colorado River to Los Angeles. This aqueduct was built across one of hottest, driest, most sparsely populated, and miserable stretches of land in the United States. It is the same area used by General Patton to toughen his troops prior to the North African desert warfare campaign of World War II.

It was impossible for the group of employers constructing the aqueduct to obtain adequate medical care for industrial injuries in this isolated area. Neither the workers nor the employers were satisfied. A solution to this problem was reached when a small group of physicians proposed to provide the industrial medical care on a prepaid basis, actually a few cents per employee per day, based upon a percentage of the premium paid for workmen's compensation insurance. These physicians had a field hospital constructed and provided industrial medical care for the injured worker. This venture proved to be a satisfactory arrangement for employee, employer, and the physicians, and this was the beginning of prepaid medical care, provided by a closed panel group of physicians, in the Kaiser Company. It arose out of the necessity to supply industrial medical care to a group of workers in a geographically isolated, sparsely populated, and medically barren area.

In the late 1930's a number of dams were constructed in western United States, and the Kaiser Company was involved in the construction of several of them. Again, large numbers of men were engaged in construction projects in remote areas. Many of the same employees who had worked on the aqueduct projects in the desert were employed on the dam construction. They requested a type of industrial medical care similar to that which had been provided in the desert on the aqeduct project.

There was one marked difference between the dam projects and the aqueduct project. The latter was mobile, and the employee moved along with the project as the work progressed. Consequently, there were hardly any family dependents at the construction site. However, the dams were at fixed locations, and many of the workers brought their families with them. Tent and trailer communities soon sprang up, where previously there had been no communities. Again, there was a scarcity of general medical care, but this time it also affected the workers' families. Soon the industrial physicians were being called upon to provide general medical care for the workers' wives and children. The prepayment concept had been successful in the aqueduct project; so a prepaid insurance arrangement was started which provided physician care and hospitalization of the worker and his family for nonindustrial conditions. This was how the

Dr. Lewis is Medical Director, Kaiser Steel Corporation.

medical care first provided by the Kaiser Company for industrial conditions evolved into complete medical care for the worker and his family.

The beginning of World War II saw the construction of shipyards in California and the Pacific Northwest. In 1942 and 1943 a steel mill was constructed at Fontana, Calif., primarily to supply the steel needed in the shipbuilding program. Many of the workers who had worked on the aqueduct and on the dams came to work on these projects, and, again, because of isolated geographic location, an inadequate number of physicians, and insufficient hospitals, the same type of prepaid medical care was established at these locations.

Fontana, Calif., in 1942, was a town with a population of about 2,000. The principal industries were grape and citrus agriculture and the raising of poultry. There was one practicing physician and the nearest hospital was 15 miles away. The community medical services, which were inadequate to begin with, soon became completely overburdened with the influx of construction crews and steelworkers. To meet the needs for medical care of these people, a hospital was constructed on the plant site and a group of physicians obtained to provide complete prepaid medical care for the workers and their families. These physicians provided both industrial medical care of the injured worker and nonindustrial medical care for the worker and his family.

After World War II the Kaiser Health Plan was opened to other groups of employees throughout California and the Northwest. The Health Plans have grown and flourished and now they cover 255,000 persons in southern California, 341,000 in northern California, 33,000 in the Pacific Northwest, and 12,000 in Hawaii, or a total of 641,000. Kaiser employees covered by the Kaiser Health Plan make up only about 6% of the total membership, and the majority of this 6% is made up of Kaiser Steel employees and those of the various Kaiser enterprises at the Oakland, Calif. offices. The arrangement of a Kaiser Foundation Hospital and Permanente Medical Group in close proximity to a Kaiser industrial plant has occurred only at the Fontana Plant of the Kaiser Steel Corporation. There is no similar arrangement at any of the 85 other Kaiser plants. Rather, the Kaiser Medical Centers are located according to population and community needs. There is no longer any emphasis on industrial medicine, but, instead, the emphasis is on providing general medical care for the member and his family. There has been a complete transition from the original function of providing only industrial medical care to the aqueduct workers in the desert.

At Kaiser Steel, enrollment in the Kaiser Health Plan is voluntary, as it is in the other Kaiser industries where the Kaiser Health Plan is offered. There is always a choice of medical care plans offered. For example, at Kaiser Steel each employee annually can choose to be covered by one of the following: The Kaiser Health plan, a plan provided by a private insurance carrier, or no health insurance at all. At the present time, at Fontana, 96% of the employees have chosen the Kaiser Health Plan.

The Kaiser Health Plan is made up of three basic divisions: an insuring group to which premiums are paid; a hospital group that provides the hospital facilities and in-hospital services; and a series of group-practice associations of physicians which furnishes inpatient and outpatient physician service. In essence, the Health Plans agree to provide certain medical coverage to a group of health plan members and their families for a monthly premium. A variety of health plan coverage is offered by the Kaiser Health Plan. An employer and/or a Union can negotiate health plan coverage varying in cost from $12 to $20 per month per family subscriber, depending upon the amount and type of medical coverage offered.

The type of Kaiser Health Plan now being offered to the employees at the Kaiser Steel Corporation costs $19.54 a month per employee. The cost to the individual employee varies as to the number of his dependents; the more dependents, the more the cost. On the over-all average, the employee pays half and the Company pays half the cost of the plan. At Kaiser Steel the plan covers practically all nonindustrial illness for the employee and his family. Briefly, it includes 125 days in hospital annually, outpatient and inpatient physician care, all drugs and medicines while hospitalized, all x-ray services, laboratory fees, physical therapy, visiting nurse services, and other benefits. It excludes mental illness, attempted suicide, alcoholism, contagious diseases, and conditions covered by Workmen's Compensation.

I believe that this medical care package is more comprehensive than the usual medical care package now available in industry. Further, it is my observation as a physician that a large quantity of medical care is being delivered to our employees at a price which is competitive with other medical care plans, and that the quality of this care compares equally with that generally available in our area. Ap-

parently our employees approve of it, for 96% subscribe to it.

Now, I should like to discuss the industrial medical program of the Kaiser Steel Corporation. Again, let me state that our industrial medical program is separate and distinct from the Kaiser Foundation Health Plan and its clinic-hospital arrangement in the city of Fontana. The same is true of our industrial medical programs in each of the Company's subsidiary plants and mines. This separation began with the inception of our present industrial medical program in 1956. Prior to that time, the industrial medical program was primarily reparative in nature. Industrial first-aid was rendered by a nurse-manned first-aid station within the plant, with the more seriously injured employee being taken to the nearby Kaiser Foundation Hospital for treatment. Turnover of physicians assigned to industrial work was high, basically because of lack of interest; and the quality of the industrial medical service suffered because the physicians assigned lacked training, experience, and interest in industrial medicine as such. The industrial medical program lacked planning and direction. In 1955 a thorough study by the company showed that not only was this program expensive, it was also not achieving many of the goals desired in a modern industrial medical program. As a result of this study, the company decided to separate its industrial medical program from the health program for nonindustrial care. It decided to employ physicians and ancillary medical personnel whose training and primary interest was in the field of occupational medicine. A new medical building was built at the geographic center of the plant and was staffed and equipped. During the past three years an industrial medical program for our company has evolved, incorporating the modern concept of preventive occupational medicine. Similar programs have been started at each of our subsidiary operations. At all of our installations, the industrial physicians have a choice of medical consultants to aid them in the treatment of industrial illness or injury. At Fontana most of the major traumatic surgery is done at the Kaiser Foundation Hospital, for it is the closest general hospital and is staffed with competent surgeons. However, whenever indicated, we do obtain consultations from other medical consultants in the area and we do make frequent use of other consultants.

Our medical relationships with the physicians of the Permanente Medical Group and with the physicians in private practice in our area have been quite good. All of our industrial physicians are members of their respective county medical societies.

Our day-to-day working relationships with the individual physicians in the Permanente Medical Group is the same as that enjoyed by most industrial physicians with the other practicing physicians in the community. Good medical ethics are being observed; there is no transfer of medical information without patient consent. Completely separate and confidential records are kept.

The good working relationship with both the physician in private practice and the physician in the Permanente Medical Group has led to a job placement program following serious illness or injury which is outstanding in our type of industry. Also, the fact that the vast majority of our employees receive their medical treatment essentially from one group of physicians simplifies the control of our medical leave program. We believe that the present industrial medical program is meeting most of the goals which we hope to achieve in a preventive occupational medical service.

Summary

An account is presented of the origins of the Kaiser Foundation Health Plans, its hospitals and medical groups, and the industrial medical program at the Kaiser Steel Corporation. Historically, the Kaiser Health Plan grew out of a need for industrial medical care for employees in isolated areas. Because these areas lacked adequate community medical facilities, it soon followed that the nonindustrial medical care of the employees and their families was undertaken by the industrial physicians. The cost of this care was provided by prepaid insurance. Gradually the industrial medical care became subservient to the general medical care of the worker and his family and as a result lost its effectiveness. Because of this, the company undertook a new program of industrial medicine for its employees completely separate from the existing health plan. This has led to improvement in the industrial medical program and to good working relationship between this program and the Kaiser Foundation Health Plan and private physicians in our area.

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Interrelated Medical Care Plans in Southern Appalachian Coal Fields

John D. Winebrenner, M.D., Knoxville, Tenn.

PERHAPS one of the hardest tasks for all of us who try to devise means to prevent, relieve, or cure illness is to relate the different aspects of medical services to the whole objective of healthful living and to the economy of our times. We physicians say we endorse the principles of preventive medicine. The people know we have said this. We claim to know how to produce the best medical care in the world. The American public expects us to do so. The most acute problem we face is how best to deliver it to the consumer. In this time of abundance of opinion and sparsity of fact, timely studies are being undertaken by unions, management, and organized medicine itself. We are as a profession, we say, responsible for leadership in medical affairs. We shall remember these days of opportunity whether or not we fulfill this mission.

The purpose of this commentary is to discuss the integration of the interests of industry, the worker, public health, and medical services of rural communities. Modern industry and organized labor are more and more thinking of the worker as a total being, and this should encourage the evolution of a practical public and professional attitude toward efficient and quality medical care. We need to spread our concern to include the particular needs or attributes of all the community's segments or activities and to emphasize the care of the whole man and not a piece of him. The well-being of the employee, whether it be during plant time, home time, or play, has a bearing on the consistent productivity of the individual.

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Presented at the Forty-Fourth Annual Meeting of the Industrial Medical Association, Chicago, April 29, 1959.

It has been mentioned by many writers that absenteeism is only one gauge of the loss in efficiency of the employee. The employee's emotional problems or worry over costs of illness at home and his confidence in the quality and availability of medical service certainly affect individual happiness and efficiency. These things are only vaguely measurable in terms of industrial profit or loss, but it is obvious that organized employees are steadily making their needs known by means of collective bargaining for health benefits in their labor contracts. In this respect, both labor and management are rapidly becoming important determinants of the character of health services in industrial communities. There is at last a growing trend of liberality toward experimental ways of providing or paying for health services.

The goal of complete prepaid medical care is much more than the fancy of a few eccentrics and labor leaders. There is a slowly rising chorus of consumers who pay the bill. We should take note that the majority still prefer some form of nongovernmental plan or insurance. We should also be aware that medical care is tending to change from a personal service to a public commodity. The growing demand for a systematic method of payment for medical care will inevitably be followed by a demand that sound business principles be applied in its purchase. At this particular time we are in a phase of confusion. In spite of so many conflicting theories, it would seem quite significant that nearly all differences revolve around questions of economic feasibility, rather than professional objectives. There are a few physicians, perhaps, who have been able to control their enthusiasm for assuring early diagnosis, preventive therapeutics, and rehabilitation. But the principal reluctance lies in the attack upon the economic barriers.

Our present insurance plans are inadequate, first, because they fail to cover enough and, second, because preventive medicine is excluded by nature of the contract. More comprehensive plans will be devised. Industry has a stake in bringing this about. Dr. Kehoe has recently reiterated the urgent need to apply effectively the principles and techniques of epidemiology and preventive medicine to the problems of industry in relation to the communities wherever they exist.[1]

The metropolitan areas of large cities have established patterns of medical care that are generally better than those of rural areas because of the greater concentration of physicians and superior facilities. It is in the large cities and in highly industrialized areas that the greatest studies have been made to meet economic problems by use of prepaid and broad-coverage service plans. The small community presents a more intimate problem to the industry situated in a rural environment. In this latter setting the enlightenment and interest of industry often make the difference between good or mediocre health security for the employees.

Preventive medicine in all its aspects will never be broadly or adequately employed until it becomes an implicit part of everyday medical care for both the family physician and the people he serves. The best medical care is logically that which teaches sound habits of hygiene to avoid illness and maintain health. It must include adequate physical examination, establish early diagnosis of disease, apply modern therapeutics promptly and effectively, and render continued guidance until the patient is restored to health. This is the kind of medical care the insurance business fears is prohibitive in cost. We do not, perhaps, have all the answers, but this has not stopped a growing consumer demand nor a willingness of various groups to try to provide it experimentally.

Even in a rural area medical schemes are occasionally devised that provide broad coverage with outstanding success. An organized system of payment such as a payroll deduction for family health service is often a decisive factor for success or failure of these medical plans. Consumer costs of such programs are not necessarily less, but they fulfill more generously the health needs of the people. Broad or comprehensive prepaid services when properly organized can utilize preventive medical measures as a tangible asset in the financing. The main point is that reduction of illness shall reward the physician as well as the patient. The idea: It pays to keep well! This factor in itself should appeal to industry. The benefits of a healthier community, even though derived indirectly, influence the productivity and efficiency of the plant.

The Southern Appalachian coal fields have been described as "the largest rural slums in America."[2] Some of us are somewhat familiar with the history of mountain coal camps or villages that were created by necessary company paternalism. This is the past of the industry, but the mountain towns retain a character that sets them off from communities that have grown up under the influence of diverse business and trade. There remains quite a challenge for one who wishes adventure in the fields of environmental sanitation or community organization.

The last decade has witnessed changes in the mountain society, some for the better, some not. None of the changes is more dramatic than the revolutionary improvement in the standards of medical care and the improvement of medical facilities. But changes have not been uniform. Not all communities have received unmixed blessings. Camp doctors have nearly disappeared, and so has much of the close personal relationship with a neighborhood physician. Nearly all babies are born in the hospital, and medical services have tended to concentrate about rural hospitals or clinics, quite often many miles from the patient's home.

From the patient's standpoint there are other disadvantages in some of the new medical services. Many young physicians appear to be better scientists than psychologists. The pendulum has swung away from the art of medicine. Yet to influence the patient there is need for the art as well as the science. It is still an essential component of good medical care. We conclude from what patients tell us that sympathetic understanding still heads the list of what is desired in a physician.

Some of these rural mountain services, however, afford an unusual opportunity to observe combinations of plans that separately insure parts of the medical care needed in the community. For illustration, let us take a glimpse at one medical group in a relatively isolated valley[3] that has been able to surmount most of the economic barriers to preventive medicine and achieve a broad medical service on a prepaid basis. The economic resources of this medical organization are derived from *(a)* the industrial services provided by the company, *(b)* a local "home and office" plan prepaid through payroll deduction and including family members in the full scope of benefits, *(c)* UMWA Welfare and Retirement Fund providing for hospital and specialist service

to its beneficiaries, and *(d)* various insurance plans offering partial payment together with fees for service.

The local plan functions in a rather compact population group providing home and office care to about 80% of the individuals in the community. This plan provides for nearly all drugs required and for all preventive medical measures. Since there is no item charge for office care, immunization has become an integral part of the family physician services. Preventive medicine is implicitly accepted as being as essential as any other medical service. It is also interesting that even dental services are available through a company employee credit system whereby the dentist is paid by deduction from wages. The advantages of this complementary relationship of dental to medical service is made clear by contrast to most areas where dental needs are appalling.

This service is unique in the degree to which it has harnessed various fractional financial resources and interests to provide relatively comprehensive medical care for the whole man. Through these arrangements, physicians are able to provide for industrial as well as family health with adequate clinic and hospital facilities. The plan offers a choice of physicians limited to the group, but every patient must have a family physician. Ambulatory care is emphasized and utilized to the extent that the incidence of institutional service is the lowest in the area. Routine physical checkups are encouraged. Basic laboratory and immunization services have progressively become a habit both with the physician and the patients. The service is still improving in scope and organization as the idea of seeing the doctor to keep well slowly replaces the idea of being "doctored when down sick."

It is noteworthy here that the danger of an "overwhelming overuse" of service by patients has been turned into an asset rather than a liability. Contact leads to communication and to understanding and to influence. The physicians have not been inundated by useless demands because they have learned to manage their patient relationship in such a manner that both physicians and patients enjoy an enviable mutual confidence in their professional service. The working efficiency of this community is without parallel in the area, and the seeds of good citizenship have taken root in a manner that offers hope and pride in common achievement.

In no other field has union and management been able to achieve so much unity with so much success as in their common interest in health. Even the public health field of environmental sanitation has not escaped the direct influence of this enthusiasm, and community problems have been approached by education and the solicitation of public and company interest. Fluoridation of the water supply was accomplished three years ago. A new sewage disposal plant is about to go into operation. An intensive rat-control program is under way, and modern garbage collection and storage is being started. Cooperating with public health and school officials, the physicians have long carried on an exceptional school health program with routine physical examination, immunization and hygiene lectures in the classrooms.

When we search for the key to better health, it is still found in the doctor's office, in the advice and guidance given to the patient in the personal words of the physician. Yet there are some people for whom the inanimate hospital has already replaced the physician as the symbol of healing. We constantly add to the number of hospitals and add to the number of beds as if this is the ultimate road to better health for our people. Truly, hospital bed and board is a convenience to the physician and often to the patient. Certainly, voluntary insurance has greatly exaggerated the patients' demand for elective hospitalization—elective, that is, only if we provide an alternative. Insurance is only a mathematical device—neither creative nor idealistic. In the end it will be economics that will convince us of the wisdom of providing for diagnostic and preventive services outside of the hospital. Economics will prove the value of medical service oriented to keeping people well and a method of payment ingenious enough to reward the elimination of illness. In the words of Dr. Warren Draper,[4] "The hospital is by no means the last word, but rather the last resort. There are many ways of lessening or avoiding human suffering and distress that are far more effective than anything the hospital can offer. . . ."

If we try to evaluate health care today, we have to dissect through a confused maze of consumer arrangements with technical groups, agencies, and associations. This state of affairs has derived from the need for economic experimentation. We may have the best health services in the world, but we must deliver the service to our people. We as practitioners of the healing arts complain when books are written and speeches are given which boldly attack our lack of communal wisdom, our fear of change or experimentation, and our exhibition of social irresponsibility. These do not attack our personal integrity! In the main, they are asking our profession for leadership,

and they mirror the desire and needs of our society. We are never very well prepared for changes, but we can do better when we get our heads up and revise archaic systems and thought and move aggressively in philosophy and action toward the remedy of the medico-economic indigestion that besets our growing robust nation.

Summary

Those in industry who are engaged in planning for medical service have become more and more concerned with the health security of the employee in his home environment. The importance of the worker's family is being recognized by both labor and management in the development of fringe benefit programs. Cooperative planning by industrial medical services and community medical groups offers certain possibilities of mutual advantages to all concerned.

In the Southern Appalachian coal fields can be found examples of the use of prepayment plans which facilitate medical care inclusive of preventive medical services as an integrated part of the medical service for the worker and his famliy. There is a great advantage as well as need for cooperation of all concerned, including the employer or company, the working force, and the other people of the community, so that the common objective of improvement and support of a better and broader medical care program, including preventive medicine, might be attained.

Dr. Winebrenner's address is 1209 Euclid Avenue, Knoxville 21, Tenn.

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Topical Review

Fluorides: A Critical Review

I. The Occurrence of Fluoride in Air, Food, and Water

Jacob Cholak, Ch.E., Cincinnati, Ohio

FLUORINE, in combined form, is one of the most widely distributed elements in the earth's crust, according to early reports by Clarke and Washington[47] and Goldschmidt,[76] being present to the extent of 270-290 gm per ton to a depth of 10 miles. More recent investigators have found even higher concentrations, the average values ranging from 400 up to 800 parts per million in the earth's crust.[16, 102] It is not surprising, therefore, that compounds of fluorine should be present in vegetation, water, air and the flesh and organs of all living things. As early as 1803, fluoride was reported to be present in the osseous substance and in the enamel of fossil teeth.[133] In 1822, fluoride was detected in mineral waters[17] and, in 1872, in the gases from a volcano.[165] Subsequent advances and improvements in analytical techniques have led to the verification of its presence in varying amounts in many natural materials, and today it is doubtful, when the size of the sample is adequate, that air, water, vegetation, or food materials absolutely free from fluoride can be found.

Air

Although experiments and practical experience have demonstrated that hydrogen fluoride is highly toxic for certain sensitive plants, there is a surprising lack of precise information concerning the concentrations of fluoride in air that are capable of injuring such plants. Even when such data are given, their reliability is often open to question. The volume of air sampled, the location of the sampling site in relation to the source of pollution, the method of sampling, the sensitivity of the analytical method, and the nature of the pollution (gaseous or particulate) must all be considered in determining the reliability of reported data.

Table I lists the findings obtained by the analysis of samples collected by liquid trapping devices. These findings portray the total fluoride (gaseous and particulate) content of the atmosphere. In many instances the values derive from investigations prior to 1951, when the volumes of air sampled were inadequate for the determination of trace quantities of fluoride. Frequently the sampling sites, although situated in residential areas, were not so far removed from local industrial sources as to yield results representative of general or widely prevalent atmospheric conditions. For purposes of comparison, all of the results are recorded here as parts of fluoride per billion parts of air (ppb), regardless of the manner in which they were expressed originally.

A number of investigators have determined the fluoride content of the particulate matter collected from the air in certain cities. In general, the particulate matter from 2,000 or more cubic meters of air was collected, so that the sample or the aliquot portion chosen for analysis always contained more than 5 μg. of fluoride, thereby insuring a reasonable degree of analytical accuracy. Such results, obtained in a number of communities and expressed as average values, are listed in Table II. Since the reliability of certain of the findings reported in Table I is dubious, more observations will be needed to establish the significance of the large differences noted as between samples collected in the impinger and on the filter.

More recent work with improved methods for determining the total fluoride content of the air, when large volumes of air were aspirated through liquid collecting media, indicate

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that the concentrations of fluoride in the air (Table III), except in areas in direct association with sources of pollution, are frequently much lower than those listed in Table I, and only slightly higher than those in Table II (particulate matter). Most of the samples (except that reported from Venice, Italy) were collected in residential or rural areas. They indicate that fluoride is present in the air even in areas far removed from industry. Of interest in this respect is the observation reported by Williamson,[203] who, in a region of endemic fluorosis near Lake Nakuru in Kenya, East Africa, found that the content of fluoride in the dust on the lake shore was 5,000 ppm, while that of dust taken from shelves in the huts of natives in the area, was 150 parts per million.[203]

TABLE I—THE OCCURRENCE OF FLUORIDE IN THE ATMOSPHERE IN A NUMBER OF NORTH AMERICAN AND BRITISH COMMUNITIES
(Total F^- in ppb)

Location	Average or Mean	Range	Reference
Baltimore (1950)			
Industrial area	18	0.00–80	43
Residential area	8	0.00–21	43
Cleveland (1949-50)	14	0.00–>63	61
Donora (1948-49)	8	0.00–>30	167
Donora (1949)	6	0.00–60	43
Los Angeles (1948)	8	0.00–25	175
Cincinnati (1946-51)	....	....	44
All areas	5+	0.00–25	....
Rural areas	4.7	0.00–25	....
Residential area	6.0	0.00–25	....
Industrial and commercial area	5.0	0.00–25	....
Charleston, W. Va.	3+	0.00–50	43, 202
Detroit (1951)	.9	0.00–4.1	48
Fort William, G.B.	....	33–48	4

TABLE II—FLUORIDE IN PARTICULATE MATTER COLLECTED FROM THE AIR OF A NUMBER OF CITIES IN THE UNITED STATES OF AMERICA

City	Average Value as ppb	Reference
Los Angeles	0.45	35
Los Angeles (1954)	1.10	45
Detroit	0.05	35
Detroit	....	48
Philadelphia	0.29	35
Chicago	0.04	35
New York	0.25	35
Cincinnati	0.25	35
Kansas City	0.01	35
Portland	0.00	35
Atlanta	0.06	35
Houston	0.00	35
San Francisco	0.45	35
Minneapolis	0.07	35
Charleston	0.00	35
Louisville	0.00	35
Pasadena	0.50	45

Food

Fluoride can be expected to be absorbed from the soil by vegetation in amounts depending, in part, upon the solubility of the fluoride mineral present in the soil. The absorption of fluoride from the soil is generally low, since fluoride may be fixed or rendered insoluble by calcium in the soil.[120, 164] No essential difference is found in vegetation grown in soils containing low and high concentrations of fluoride, whether of natural or artificial origin.[68, 85, 119, 130, 191] Numerous investigations have shown that the distribution of fluoride varies in different parts of the same plant following absorption from the soil, the roots generally containing the highest, and the leaves and fruit the lowest, concentrations. The pattern of distribution is different when hydrogen fluoride or hydrofluosilicic acid is present in the atmosphere, for, under these circumstances, localization will occur in the leaves.[208] Smoke from combustion of coal is an important source of air-borne gaseous fluoride.[42]

In plants, generally, with few exceptions, the concentrations of fluoride are seldom below 0.10 or above 10 ppm.[139] A noteworthy exception is the plant from which leaves of tea are harvested. In the latter, the concentrations range, generally, from 8 to 400 ppm,[68, 125, 161, 198] but concentrations as high as 1,758 ppm[161] and 1,900 ppm[125] have also been reported.

TABLE III—THE OCCURRENCE OF FLUORIDE IN THE ATMOSPHERE OF A NUMBER OF COMMUNITIES
(Total F^- in ppb)

Location	Average or Mean	Range	Reference
Cincinnati (1957)	0.35	0.04–1.20	98
New York*	2.0	....	91
Yonkers (summer)*	....	0.2–0.4	128
Spokane	1.6†	....	2
Portland, Oregon*	....	0.6–0.8	207
Rural	0.3	....	207
Salt Lake City*	....	0.05–1.0	78
Logan, Utah*	0.02	....	78
Canada-Wash. Border*	0.3†	....	2
San Francisco Area*	....	0.2–0.4	....
Venice, Italy (1956)	4–145	0–>1000	145

*Personal communications.
†Single determinations.

Other exceptions are certain plants growing in areas immediately adjacent to factories processing fluoriferous raw materials.[4, 42, 137] Other plants which have been demonstrated to accumulate fluoride are dogwood, hickory leaves, and the African plant "Gifblaar."[124, 164] The latter plant (Dichapetalum cymosum), when used as food, is particularly toxic for grazing animals. The high toxicity is said to be due to the ability of the plant to synthesize potassium fluoacetate.[124] It is believed that the fluoride in plants, generally, is inorganic in nature.

The mean daily intake of fluoride in the diet of man is low, as illustrated in Table IV, wherein are listed the amounts consumed daily in food in a number of countries. The values listed opposite the named localities in the United States, with the exception of Cincinnati, as noted in Table IV, relate to the food alone and do not include that in drinking water. The levels of concentration of fluoride in the water of these communities are indicated in parentheses. The values indicated opposite the listed American communities were obtained by the analysis of duplicates of the prepared meals of at least two persons in each of these communities, collected daily over periods of 40 to 160 days.[87] It may be seen that the quantity of fluoride in the prepared food of the subjects in the several areas, with the exception of O'Donnell, Texas, increases with increase in the concentration of fluoride in the drinking water of the areas. Much of this increase is due, no doubt, to the water used in preparing the food. In the exceptional case of the subjects in O'Donnell, Texas, the relatively small amounts of fluoride in the prepared meals may be due to the fact that much of their food was shipped in and was of such type as to require little local water in its preparation.[87]

In the daily intake of fluoride, as represented opposite the names of individual countries, is included that derived from all beverages. The contribution made by tea may have constituted a significant proportion of the total fluoride.[83, 118]

Comprehensive investigations of the fluoride content of specific items of the food of various countries have been made by Machle, Scott, and Treon,[119] Gabovich,[68] Reid,[161] Nömmik,[139]

TABLE IV—THE QUANTITIES OF FLUORIDE IN THE FOOD CONSUMED DAILY BY ADULT PERSONS IN CERTAIN COUNTRIES

Location*	Mg in Food†	Reference
United States of America		
Cincinnati, Ohio (0.1)	0.34–0.80	87
Galesburg, Ill. (2)	0.94–1.16	87
Ennis, Texas (5-6)	1.32–1.35	87
Lake Preston, S. Dak. (6)	0.99–2.19	87
Bartlett, Texas (8)	2.33–3.13	87
O'Donnell, Texas (18)	1.41–1.49	87
(Average general diet)	0.2+–0.3+‡	11, 130
Norway	0.22–3.1	55
Russia	0.6–1.2	68
Canada	0.18–0.3	83
Switerland	0.5	64
England	0.6–1.8	118

*The numbers in the parentheses following the American cities represent the levels of concentration of fluoride in milligrams per liter, in the drinking water.

†Inclusive of that in the drinking water.

‡Exclusive of drinking water.

TABLE V—THE LEVELS OF CONCENTRATION OF FLUORIDE FOUND IN VARIOUS ITEMS AND CLASSES OF FOODS BY VARIOUS INVESTIGATORS IN VARIOUS COUNTRIES

	Ppm Fresh	Ppm Dry	References
Meats	0.01–7.7	3.8–7.7	41, 49, 55, 64, 68, 119, 127, 130, 132
Fish	<0.10–24	–84.5	41, 49, 55, 64, 113, 119, 130
Citrus fruits	0.04–0.36	1.4–2.2	64, 119, 130, 161
Noncitrus fruits	0.02–1.32	0.42–12	55, 64, 119, 126, 130
Cereal and cereal products	<0.10–20	0.0–64	41, 49, 119, 126, 130, 139, 151, 161
Vegetables and tubers	0.10–3.0	0.0–28.3	49, 55, 64, 68, 119, 130, 139, 155
Miscellaneous material			
Tea	3.2–400	–1900	39, 41, 68, 84, 119, 125, 130, 161, 198
Wine	0.0–6.34	....	6, 32, 39, 49, 130
Beer	0.15–0.86	....	201
Milk	0.04–0.55	....	39, 49, 55, 63, 73, 83, 119, 130, 139
Salt (table)	0.02–115.1	....	39, 64, 68
Bone Meal (edible)	246–770	....	15, 83
Coca Cola	0.07	....	83
Eggs	0.00–2.05	....	68, 119, 130
Butter	0.4–1.50	....	119, 130
Sugar	0.10–0.32	....	119, 130
Baking powders	<0.10–220	....	41, 130
Cheese	0.13–1.62	....	55, 119, 130
Coffee	0.2–1.6	....	130

Clifford,[49] Matuura and associates,[125-127] and von Fellenberg,[64] while McClure,[130] Truhaut,[190] and Bredemann[23] have assembled published data relative to the fluoride content of a large number of foods. The ranges of concentration in representative foods are summarized in Table V in parts per million of both fresh and dried material. Consideration of the data on the daily fluoride intake in Table IV, on the basis of those representative of the concentration of fluoride in various classes and items of food, in Table V, indicates that the levels of concentration in foods, generally, are low. The higher figures in the ranges given in Table V, as a rule, are exceptional, and in some instances they are based on a single finding which may not be representative. The significance of the results obtained by the analysis of certain vegetables, tubers, and fruits may be questioned, because of possible contamination either from the soil or from the residues of fluoride-containing insecticides used as sprays.[130] However, without doubt, certain food materials contain relatively high concentrations of fluoride. These include fish foods, teas, and some wines. Sea water contains fluoride in concentrations of 1.2 to 1.4 ppm[130, 186] and is the likely source of the higher levels of fluoride in sea foods. McClure[130] considers the amount of bone, particularly in canned fish, to be the determining factor in the quantity of fluoride contained in the product. The data on tea from various sources are in remarkable agreement as to its high fluoride content. Since as much as 75% of the fluoride is extracted from tea leaves by boiling water,[130, 161] tea represents an important contributor to the dietary fluoride in some countries.[83, 84, 118] Some wines contain considerable quantities of fluoride, but McClure[130] considers that the consumption of wine does not contribute markedly to the dietary intake of fluoride. With these exceptions, the average fluoride content of all other foods may be expected to range from 0.1 to 0.3 part per million.

Water

Because of wide interest in the role of fluoride in drinking water in relation to dental caries, the analytical data concerning fluoride in all types of natural waters are voluminous. Fluoride has been found in rain water in amounts that vary with the distance from urban centers and industrial installations.[3, 64, 121] Various sources account for the fluoride washed down with rain water, but in populated areas, coal smoke, generally, is the chief contributor of fluoride to the atmosphere. Fluoride in concentrations ranging up to 295 ppm has been detected in Utah coals,[42] while Crossley[53] found that many coals contain more than 80 ppm, and some coal shales, up to 460 parts per million. Rain that does not evaporate or run off the surface may penetrate into the soil and come into contact with fluoriferous material. Subsoil or underground water, therefore, may contain appreciable quantities of fluoride, depending upon the geologic structure of the area. Mineral springs fall in this category. The presence of fluoride in natural waters was first reported by Berzelius in 1822, when, in a letter to Berthollet, he reported that the waters of the Carlsbad spring contained fluoride in the concentration of 3.2 parts per million.[17] Mineral springs are not always sources of drinking water, but the waters of some may be used for medicinal purposes. Surface waters, except under unusual circumstances, are generally low in fluoride, the levels being usually below 1 part per million. Sea water has been reported to contain from 0.86 to 1.4 parts per million.[186] The levels of concentration found in certain natural waters are tabulated in Table VI. With the exception of rain waters, none of these is used regularly for drinking purposes.

Comprehensive surveys of the occurrence of fluoride in drinking water have been made in many countries. A summary of the results obtained in various parts of the world is presented in Table VII. As may be seen, some of these waters are high in fluoride, but these have come, in the main, from areas of endemic fluorosis. These tables also include data pertaining to mineral waters not used regularly for drinking purposes, as well as to various types of potable underground waters such as from ordinary wells, artesian wells, and the

TABLE VI—THE OCCURRENCE OF FLUORIDE IN VARIOUS NATURAL WATERS

Type	Parts per Million Average or Range of Concentration	Reference
Rainwater		
Switzerland	0.016–0.026	64
Tennessee	0.0–1.40	121
Washington	0.0–99.00*	3
Ukraine (U.S.S.R.)	0.0524 (average)	69
Old Faithful Geyser	40	78
Great Salt Lake	0.5–2.00	78
Lake Nakuru (Kenya)	2800	203
Thermal waters of Plombières (France)	15.5–99	37
Sea water	0.8–1.4	186

*Micrograms in samples of rainwater collected following each rainy period.

TABLE VII—THE OCCURRENCE OF FLUORIDE IN VARIOUS WATERS OF THE EARTH

Location	Parts per Million Average	Range	References
North America			
The U.S.A.			
Alabama	....	0–6.8	29, 96, 110, 156, 163
Arizona	....	<1.0–33.5	173, 192, 194
Arkansas	0.10	0.0–3.0	82, 183, 194
California	....	0–7	88, 131, 194
Colorado	....	0–5	88, 194
Connecticut	0.12*	0–0.4	88, 115*, 194
Delaware	0.09*	0–0.2	116*, 194
Florida	0.21*	0–2.5	18, 19, 88, 116*
Georgia	0.20*	0.0–2.0	30, 88, 96, 109, 116*, 194
Hawaii	....	0–2.22	136
Idaho	....	0.3–5.0	54, 88, 194
Illinois	0.49*	0–4.0	20, 88, 96, 117*, 142, 169, 194, 200
Indiana	0.25*	0–2.0	88, 92, 117*, 142, 194
Iowa	....	0–2.8	79, 81, 194
Kansas	....	0–10.0	88, 103, 104, 112, 157, 194
Kentucky	0.5	0–3.9	62, 142, 197
Louisiana	....	0–6.0	88, 122, 194
Maine	0.11*	0–0.4	88, 115*, 194
Maryland	0.04*	0–5	16, 52, 88, 96, 116*, 194
Massachusetts	0.12*	0–8	88, 96, 115*, 194
Michigan	0.22*	0–2.0	88, 96, 117*
Minnesota	0.16	0–3.2	5, 88, 96, 158
Mississippi	....	0–6.0	26, 88, 194
Missouri	....	0–5.0	88, 96, 169, 194
Montana		No records	
Nebraska	....	0–2	12, 88, 194
Nevada	....	0–5	88, 194
New Hampshire	0.11*	0–0.5	88, 115*
New Jersey	0.08*	0–2.1	13, 88, 114*
New Mexico	....	0–12.0	47, 62, 65, 88, 192
New York	0.09*	0–1.3	96, 114*, 194
North Carolina	0.13*	0–4.2	44, 111, 116*, 150
North Dakota	....	0–7.5	1, 38, 88, 141, 194
Ohio	0.17*	0–3.0	88, 96, 108, 117*, 142, 168, 192, 194
Oklahoma	....	0–2.4	88, 96, 166, 193
Oregon	0.03	0–0.5	88, 178
Pennsylvania	0.06*	0–2.0	66, 88, 114*, 192, 194
Rhode Island	0.08*	0–0.8	7, 88, 115*, 149, 194
South Carolina	0.48*	0–7.0	62, 116*, 171, 172, 194
South Dakota	....	0–1.2	51, 88, 192
Tennessee	....	0–2.0	56, 88, 194
Texas	....	0–7.2	24, 25, 44, 88, 182, 185, 192, 193, 194
Utah	....	0–5	88, 194
Vermont	0.02*	0–0.1	115*. 194
Virginia	0.12*	0–7.5	33, 88, 116*, 194
Washington	....	0–5.0	88, 194
West Virginia	0.14*	0–0.6	116*
Wisconsin	....	0–2.8	59, 187
Wyoming	....	0.1–1.2	194, 204
Canada	....	0–1.2	21, 50, 83
Mexico	....	0.1–17.5	129
Cuba	....	0–0.4	10
South America			
Argentina	....	0–1.6	77, 88, 148
Brazil	....	0–0.60	8, 70, 174
Ecuador	....	0–6.3	134
Peru	....	0–1.4	123, 152, 206
Europe			
Austria	....	0.38–0.8	23, 101
Belgium	....	0–1.68	27
Cyprus	....	0–3.6	22
Czechoslovakia	....	0–28.00	23, 105, 153
England	....	0–4.5	89, 135
Finland	0.57	....	95
France	....	0–7	23, 28, 37, 71
Germany	....	0–4.90	23, 80, 154, 159
Hungary	....	0–5.14	23, 146, 179, 180
Ireland	....	0–0.2	60
Italy and Sicily	....	0–7.1	23, 75, 147, 184, 196
Luxembourg	....	0.02–1.23	138
Netherlands	....	0–2	23, 176, 177
Norway	....	0.01–0.07	55
Poland	....	0–1.1	23, 74, 205
Portugal	....	–22.8†	31
Russia	....	0–4.6	23, 67, 106, 195
Spain	....	0.0–6.3	77, 90
Sweden	....	0.0–1.12	139, 140
Switzerland	....	0.01–1.42	57, 64
Yugoslavia	....	0–4.16	23, 170, 188, 189
Africa			
South Africa	....	Trace–53.0	97, 143

Table VII continued on next page.

TABLE VII—THE OCCURRENCE OF FLUORIDE IN VARIOUS WATERS OF THE EARTH—CONT'D.

Location	Parts per Million Average	Range	References
Africa—Continued			
East Africa (Kenya)	....	0–<30	203
Tanganyika	....	Trace–95	9
Asia			
China	....	0–13.0	36, 40
India	....	0–>3.0	160
Japan	....	0.02–20.0	99, 100, 107, 144
Korea	....	0.8–10.0	181
Israel	....	0.3–1.50	72
Iran	....	0.0–<1.0	93
Australia	....	0.0–13.5	94, 162, 199
New Guinea	....	0.0–<0.55	94
Papua	....	0.0–<0.55	94
New Zealand	....	0–0.9	34, 58

*Average is based on values in references marked with asterisk.

†Mineral waters only.

like. The vast majority of the people of the world use surface waters for drinking and cooking, and their intake of fluoride from water of this type is generally very low. The various surveys of the Geologic Service in the United States have included analyses of the drinking water of the major centers of population of a number of the states. The average values listed in Table VII were usually calculated from the data of these surveys and are indicative of the average experience of the inhabitants of the urban areas of these states, with respect to their intake of fluoride in their drinking water. Communities that have added fluoride to their water supplies have been omitted from these calculations. Drinking water containing unusually high concentrations of fluoride are encountered, as a rule, when underground waters are employed in areas where apatite-like deposits are found. In the United States, the waters in certain sections of Texas, South Dakota, Indiana, and Illinois were shown by Hill et al.[88] to be high in their fluoride content. In 1949, Hill et al.[88] estimated that about 5,500,000 persons (4.3% of total population) had access to communal water supplies containing fluoride in concentrations of 0.5 ppm or more, 2,200,000 persons used water containing concentrations of 0.9 to 2 ppm, 626,000 persons used water containing 2.1 to 3.0 parts per million. In the bracket "3.1 to 5.00 ppm" there were 127,000 persons, and only 25 communities, with an aggregate population of 40,000 persons, using water that contained more than 5.1 parts per million. In many other states, also, are areas in which small numbers of persons use water containing fluorine in concentrations well above the usual levels. Among these states are New Mexico, in which the water supplies of 35 communities exceeded 0.9 ppm, the fluoride content ranging from 1.1 to 12.00 parts per million.[46] In Kansas, the water of one well contained 10.0 ppm,[103, 104] and, in Arizona, the waters of 16 wells contained fluoride in amounts ranging from 8 to 11 parts per million.[173] In Florida, 35% of 498 sources of water, mainly from deep wells in the southwest section of the state,[19] contained fluoride in concentrations ranging from 1.0 to 3.7 parts per million. The water supply of the city of Sarasota, Florida, is taken from 16 deep wells in five fields. Nine of the wells are 600 to 758 feet deep, and five vary from 340 to 570 feet in depth. The finished water from the deepest wells contained 1.5 parts per million.[116] The content of fluoride in water from artesian wells in the sandstone region of North Dakota was found to range from 2.8 to 7.5 ppm,[1] and, in Alabama, that in water from wells in the Eutau formation ranged as high as 6.8 parts per million.[29]

While surface water generally contains less than 1.0 ppm, it has been reported that the granites of the Pikes Peak area contain from 0.04 to 1.00% of fluorine in the form of fluorite or fluorine-bearing mineral, and, as a result, all of the surface streams of the area contain fluoride in concentrations in excess of 1.0 part per million. This, therefore, is one of the few areas associated with the use of surface waters containing fluoride in excess of 1 part per million.[194]

In Europe, and in other areas in which large cities obtain their water from surface supplies, the fluoride content of the waters is generally very low. Only in areas where wells are used, particularly in rural areas, are higher levels of fluoride encountered. This is generally true in other parts of the world. Water from certain bore holes and wells in South Africa, containing fluoride in concentrations up to 53.0 ppm, have been used by the native population.[97, 143]

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Industrial Medical Association

THE PRESIDENT'S MESSAGE

D. JOHN LAUER, M.D.

THE Industrial Medical Association bases an important part of its educational program on the work of its standing committees, for it is through these committees that we look to ourselves for the gathering of information in a specific field, the condensation of much of this information, and often the presentation of it in a concise and direct manner so that it may serve as a guide in our day-to-day industrial practice. Standing committees, too, can serve the membership usefully by answering queries in the area of their collective competence. Another committee function, although it has been only meagerly explored, is the promotion of research on a given problem.

In spite of difficulties, we are often amazed and heartened by the accomplishments of so many of our committees. We hope to review briefly some of the outstanding recent accomplishments and, more particularly, projects presently underway.

In the July issue of the JOURNAL there appeared a statement which results from the joint effort of two committees, namely, Radiation and Chest Diseases. Their statement is a clear guide for those of us in industrial medical practice on the potential radiation exposure in periodic chest x-ray examinations.

Presently, the Radiation Committee, which was established only two years ago, is undertaking two important, broad, and difficult assignments. One is to establish criteria for the diagnosis of harmful effects arising out of work exposures to ionizing radiation and means of compensating for any resulting ill effects. The other project is the establishment of a guide for determining the relative merit of having x-rays of the back on a routine basis at the time of employment and periodic examinations of employees. It is at once apparent that both of these projects are not only ambitious but timely. They can be of great practical value to almost all of us.

Another committee that is working diligently on a vexing problem which is of interest and concern to many of us is the Committee on Cardiovascular Diseases, under the able leadership of its Chairman, Dr. C. A. D'Alonzo. In the area affecting the cardiac, the physician in industry is often faced with a dilemma. On the one side, programs and campaigns to "employ the handicapped" are of justifiable moment to him, and pressures are exerted to employ persons with various cardiac diseases, especially the post-myocardial-infarction victim. On the other side, the industrial physician often finds himself in the unhappy dual role of trying to justify a recommendation to his management that cardiac candidate A could be employed, whereas employee B, with an equal cardiac disability, brings forth a recommendation stressing the desirability and need of a pension.

Many questions arise as to the desirability of the infarction victim to continue work at all, or to his need for a job change, or the effects of stress, the value of anticoagulants, the expected precipitating factors, and, not least, the exaggerated effect of trauma in the precipitation of his condition. The Committee on Cardiovascular Diseases, recognizing these problem areas, is undertaking a continuing, long-range follow-up study on the employees of various population groups. Aided by biostatistician Dr. Sidney Pell, the committee feels that its own statistics and facts will lead to reliable conclusions. The committee promises to report on the progress of this collective study at least annually. It is anticipated that these reports will appear in the JOURNAL.

With our own official JOURNAL we can point up such projects, studies, and statements as are of practical concern to our membership.

Book Reviews

ALCOHOLISM. By Arnold Z. Pfeffer, M.D. Price $4.50. Pp. 98. Grune and Stratton, Inc., 381 Fourth Avenue, New York 16, 1958.

This second in the series of Modern Monographs in Industrial Medicine, published under the editorship of Anthony J. Lanza, M.D., was written by a former Associate Clinical Professor of Psychiatry, New York University, College of Medicine, and Director of the Consultation Clinic for Alcoholism, New York University-Bellevue Medical Center. It is a succinct presentation of (1) material essential for literacy of the industrial physician participating in a program for salvaging the alcoholic employee or anticipating the development of such program and (2) specific organizational relationships and administrative procedures for the establishment and operation of such program. The latter are presented by description of several well-known and eminently successful programs. The Consolidated Edison-New York University-Bellevue Medical Center Plan, being the one with which the author is identified, is discussed in greatest detail.

The extent of the problem of the alcoholic in industry is emphasized in the Preface by the statistics that, on the average, "the male alcoholic in industry" loses 22 working days annually ("as compared with 7.5 days for the non-alcoholic"), has an accident rate twice that of the nonalcoholic, and lives 12 years less. There are estimated to be 2,060,000 alcoholics among the male industrial employees.

The salient point referred to in several sections of the book, especially the chapters on "The Psychology of Alcoholism" and "Psychological Treatment of Alcoholism," relates to motivation, which is the key to the unique success of programs in industry. One of the psychological mechanisms characteristic of the alcoholic is "denial"—denial that he has a problem with his drinking and that he needs help. The alcoholic "usually seeks help of his own accord only when the drinking already has eventuated in marked physical, mental, vocational, or family losses." Therefore, some form of coercion must be used to force him to accept treatment in spite of his denial. Herein lies the basis for the success of programs in industry: Supervisory personnel trained to recognize the early signs of alcoholism simultaneously threaten him with loss of employment while offering him, in one way or another, the opportunity for treatment.

In the first chapter, which is devoted to "An Orientation to Alcoholism as a Disease," the author states without equivocation that "the onset of the disease is based initially on a complicated psychological disturbance and facilitated by social and cultural factors" and that "it is a universal observation that alcoholics have severe emotional conflicts, are immature, and have difficulties in personal relations." The second chapter is concerned with the "Management of the Medical Complications of Alcoholism." The uses of the ataractics and the adrenal corticosteroids are included with the traditional modalities.

"Management of Neuropsychiatric Complications of Alcoholism" briefly presents material for the industrial physician's orientation. The use of adrenal steroids is highly recommended in the treatment of delirium tremens. "They control symptoms rapidly and not infrequently have appeared to be life-saving." "The Psychology of Alcoholism" stresses that "the pre-morbid makeup of alcoholics is such that they are especially liable to psychic distress of an intense nature, and at the same time tolerance for psychic pain is markedly reduced." This psychic pain usually consists of "variations or equivalents of depression." The "basic character makeup" is considered to be that of the "self-centered spoiled child character." "Psychological Treatment for Alcoholism" describes the uses of psychoanalysis, group therapy, individual therapy, and Alcoholics Anonymous. "Adjunctive Treatments and Procedures for Alcoholism" includes the use of Antabuse, the "aversion treatment" (conditioned reflex), sedatives, vitamins, adrenal cortical extract, and ACTH. The use of Antabuse is discussed in great detail.

The section of the book having greatest applicability for the industrial physician consists of the last three chapters, which delineate several successful programs and provide specific details about their organization and operation. The most exhaustive discussion concerns "The Consolidated Edison-New York University-Bellevue Medical Center Plan." In the summary of the administration and operation of the program within the company, the author warns that "without adequate means for treatment, a company program may degenerate into mere disciplinary measures" and calls attention to a secondary benefit derived from effective programs — namely, improvement in employer-employee relations. With reference to the achievements of this plan, it is pointed out that 64 per cent of alcoholics referred to the clinic maintained their jobs, that "72 per cent of those who continued treatment at the Clinic maintained their jobs," and that "only 45 per cent of those who discontinued treatment . . . after initial interviews were able to keep their jobs." Another indication of the effectiveness of the plan is presented by the records of sickness absenteeism: Over a three-year period the average annual absences due to sickness by employees prior to referral amounted to 13.5 days—twice the average for the Company; following the institution of treatment, the absences fell to less than four days.

Brief references are made to programs instituted by the Allis-Chalmers Manufacturing Company, E. I. DuPont De Nemours and Company, Eastman Kodak Company, and Western Electric Company. It is interesting to note that in one of these programs the foreman evidently decides whether the employee should be referred to the medical department. Data are not presented that per-

mit comparison of the efficacy of the various programs. However, in the discussion of the program at DuPont, which relies primarily on Alcoholics Anonymous for its therapeutic methodology, the author remarks that "65 per cent of their drinkers" are being rehabilitated. This compares very favorably with the experience of Consolidated Edison.

For those desiring more extensive reading a total of 79 references is provided.

—E. LOWELL BERRY, M.D.

DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS. By N. Irving Sax. Price, $22.50. Pp. 1467. Rheinhold Publishing Corp., 430 Park Ave., New York 22, 1957.

This book was designed as a reference work on the hazardous properties of a variety of industrial compounds. It is the successor to Sax's "Handbook of Dangerous Materials" and is designed "to enable chemists, engineers or non-technical personnel to find quickly whether a given compound or material is potentially dangerous and what precautionary measures must be taken." There are nearly 9,000 entries in the General Chemical Section, which constitutes the greater part of the text. These are listed alphabetically and, in general, contain the following information: description, formula, constants, toxicity or toxic hazard rating, fire or explosion hazard, storage and handling, and disaster control (where pertinent). There are 11 other sections that deal with toxicology, allergic disease, physical hazards, hygiene and protection, shipping regulations, and finally an index to synonyms.

The jacket advertises the volume as "giving encylopedic information on the hazards of general chemicals and industrial materials." The preface suggests that the book will be of value to all professional workers in the field of industrial health. At the onset, however, the first paragraph on Page 1 excludes from its audience those "who have been specially trained in the field of industrial toxicology." This appears to be a factual representation of the facts for the first nine sections.

The section on toxicology is written well and for the first 15 pages presents definitions and general information which should be of value to the average physician or untrained industrial hygienist. In fact, it represents an excellent brief course in the fundamentals of industrial health. The next 12 pages, however, consist of a series of tables and descriptions of various laboratory tests. To the informed reader, these will appear unnecessary; to the uninformed, they will be confusing and even misleading. Table 1, for example, lists the presence of porphyrins under "Kidney Function Tests." Table 2 seems to indulge in various speculations concerning a limited number of substances. Table 3 lists normal blood values, Table 4 presents normal blood chemistry levels, and Table 5 attempts to demonstrate "Occupational Poisons Which May Produce Abnormalities Detectable by Studies of the Blood." The information in this last-mentioned table is ambiguous and contains misinformation which is confused by the added comment of "questionable." Table 6 presents normal values for liver function tests, and Table 7 lists 27 substances which may produce abnormalities of liver function with the admission that "pertinent information is somewhat limited." Although the tables have the forementioned limitations, the next is informative and useful.

Sections 2 to 8 are concise and excellent summaries of the background information that is necessary to basic and fundamental principles of ventilation control, personnel protection and hygiene, atmospheric pollution, radiation hazards, industrial fire protection, storage and handling of hazardous materials, and reactor safeguards. Although, in general, these sections lack the detail that might be necessary for specific problems, they provide information that will assist the physician, the toxicologist, the engineer, or the nontechnical layman to understand the many factors that are all-important in the selection of the proper measures that are necessary for the control of industrial hazards.

Section 9 is devoted to allergic disease in industry and begins with the statement that the concept of allergy explains many medical problems that until now have been "obscurely defined." This is indeed a meritorious suggestion, but the chapter itself suffers from the fact that the author's attempt to summarize industrial problems that involve allergic reactions is somewhat inadequate. Many of the fundamental concepts presented here are incomplete and somewhat outdated. The author has apparently not made use of valuable authoritative and current sources, especially in the field of dermatological allergy and occupational diseases. In addition, the author should have been aware that it is contemporary opinion that allergic hypersensitivity, whether it involves the skin or the pulmonary system, is a mechanism of tissue damage and should be regarded merely as one of several mechanisms of toxicologic reactions.

One is aware that it is impossible to describe the likely sensitizers in various occupations in any great detail, but the table that lists "Occupations, Symptoms, and Likely Sensitizers" is misleading and incomplete. The author has neglected some of the most important occupations and industries in which there are currently allergic hazards. In other instances, he has neglected to include common sensitizers in occupations that are already listed. (One must assume that listing "paints and stains" as common sensitizers for bricklayers and masons is a typographical error.) This chapter does not show an easy familiarity with the problems of American industry, and especially its machine shops and diversified chemical industries.

The concept that stimulated this volume is excellent, and it should be a useful book for reference, since it brings together data that are of importance in understanding and solving some of the problems of industrial hazards. The assembly in one place of the physical, chemical, and toxicological characteristics of a large number of materials will be attractive to many persons. The material, as a whole, is, however, a frank tabulation of information that has been compiled and published elsewhere. This remains, therefore, a work that will be welcomed by the amateur but of passing interest to the expert.

—FRANK PRINCI, M.D.

Editorial

Medical Care and Occupational Medicine

On a pleasant occasion a few years ago we were part of a group engaged in speculation upon the future trends of industrial medicine. One conclusion reached was that administrative problems of general medical care would certainly occupy the center of the stage for many medical directors and would constitute a strong, though minor, interest for most of the rest. This, it turned out, was an alarming conclusion for the particular industrial physicians who had reached it. By experience and natural preference they were practitioners of highly specialized preventive medicine in some of our most technical industrial plants. The spectre on the horizon was an ogre come to spoil a happy life. The conferees were concerned that occupational medicine would get confused with something else that is not occupational medicine at all.

Since that pleasant occasion our specialty has become somewhat defined—defined in the sense that one now takes a rather real and precise examination to become certified in occupational medicine, and further defined in the sense that a number of university faculties have been able to agree upon what should constitute the new specialty's formal graduate training programs. At the center of the definition is the sharp idea that occupational medicine concerns itself with all the relationships between clinical problems and the circumstances of working for one's living. But on both sides of this sharp idea things rapidly get fuzzy: clinical problems fade out into problems that are hard to label, and the circumstances of working for a living range from something we can all agree upon to something else upon which agreement is impossible. We need occasionally to examine activities and programs that carry the tag of occupational medicine, to see what relation they bear to the central idea. It is in this way that we now need to look at medical care programs and their administration.

It is clear that the vast majority of our people want medical care financed by prepayment of fixed amounts of money at regular intervals. It is also clear that they expect their employers to participate in making these payments, the extent of participation depending upon agreements reached between management and unions at the bargaining table.

When medical care thus becomes financed through a central point it ceases to be a set of heterogeneous, random experiences between doctors and their patients. Those who manage the funds are in a position to see problems and to raise questions about what is going on. The sums of money involved, once concealed in person to person transactions, now show up as huge totals. Common sense calls for efficient management of the enterprise, and a whole new activity called medical care administration suddenly develops. At this stage a really unfortunate outcome looms as a possibility.

If the costs of medical care continue to rise, and if serious studies show that this rise is due in substantial part to a lack of organization in the provision of medical care, we may expect industrial management to step in with its own administrative organization, to take over. It is at this juncture that the tragic confusion can occur: industrial medical directors may be asked to administer the general medical care programs, and industrial medicine will become a shapeless hulk as a result of the bolus it has swallowed. This is the hazard to be avoided.

On the other hand, industrial medical directors need to be accurately informed on develments of the medical care plans because management will be looking to its physicians for this sort of information. The original articles in this issue are offered as a starting point and as background material. Those who need to become experts will see for themselves how to go further.

Abstracts of Current Literature

Mental Health

Graham C. Taylor, M.D.

The Leisure Society. R. Denney.* Harvard Business Review 37:46 (May-June) 1959. (*University of Chicago.)

There is an increasing amount of leisure time in all economic groups in modern American society. It has long been realized that the use or abuse of leisure has important implications for the mental health of us all, and hence this article is considered of interest to occupational psychiatry. Reference is made to the new leisure resulting from shorter work weeks, to the increased availability of time, to the tendency toward mass entertainment, and to the fact that there is a certain "sopping up" of leisure by people joining many organizations and becoming members of many groups. This affects the executive as well as the white and blue collar worker. "If relatively unorganized spheres of leisure time such as gardening are dominated by compulsive behavior, how much more it must be so in the time killing that goes with organizational life!"

Leisure then is affected by the organization, but, in turn, it also affects the industrial institution in terms of affecting personnel policy, and it affects the executive directly in its changing pattern. The author states that in the first three decades of the century the emphasis was placed upon recreation—physical activity was stressed. It was felt that this would lead to a degree of relaxation which would enable the individual to function more efficiently. After World War II the pattern of leisure shifted so that there was involved what the author described as "identification," in which there is a more involvement psychologically of the self, but also a certain emphatic sharing of leisure with others." This has now been replaced by what he describes as "authentication," and in this third type of leisure there is a more direct concern with some aspects of arts or science as such, rather than a relationship with other people. This type of leisure activity involves perhaps the considerations of problems and questions in life, and may manifest itself in such activities as reading a monograph or painting a picture, or breeding a plant, or in being an amateur astronomer.

The author, in conclusion, argues that because of the increased importance of leisure in our life, and the attitudes which relate to it, we may expect some changes in the way of doing things. For example, the work pattern of the manager may involve more informal approaches to decision making, with perhaps decisions made away from his office.

Secondly, there may be a decline in office hours and office routine. The observation is made that "true leisure tends to sustain itself only in polarity with work." It is important therefore to balance the increased abundance of leisure, the attitudes toward it and how they interrelate with a corresponding attitude towards work. This entire situation is in a state of flux, and deserves careful attention and scrutiny.

The Rarest Man in Business. P. Stryker. Fortune (May) 1959.

This article is the concluding article on a series of "executive qualities," and it deals specifically with the nature of leadership in business. Some of the articles have been reviewed in this Journal. The author contends that the executive (1) "has an innate propensity for change and innovation" and (2) "emerges to change men's beliefs, attitudes and behaviors with benefit to many people." The leader is for something and he has goals which are ahead of the goals of his contemporaries. He is never simply a rebel. The leader in business also has the power to excite—to arouse people's interests in going beyond the current conventions and routines.

A point of psychological insight is made when it is pointed out that the leader does not always feel certain of his position as a leader and yet knows that his leadership will vanish with indecision.

Other attributes of the executive are his ability to function as a rule breaker and as a risk taker.

Six Pitfalls for Professionals. J. A. Litterer. Personnel Journal 38: (May) 1959.

The pitfalls described are "not peculiar to the professional aspects of personnel work; they are as dangerous to the lawyer, to the physician, accountant, and others doing professional work as to the personnel man." In the editorial comment it is stated that "if the educatuib if a personnel professional leads to a doctorate, please don't let us call him 'Doctor'!" There are six of these pitfalls:

1. *Special Language*—Special fields involve specialized language, but in speaking to people in other fields this language should be translated into other "layman language."

2. *Professional Polish*—The author describes an operation that had been completed "with delicate and neat stitches," and yet the surgeon failed to instruct that a blood transfusion be administered and the patient, as a result, died.

3. *Unnecessary Services*—For this the author refers to the special issuing of unnecessary reports in order to justify one's own position. The professional is counselled to bear in mind interests of the person for whom he is working, rather than consider his activities simply in terms of his own profession.

4. *Professional Blinders* — Each professional when presented with a problem is apt to see it in the light of his own particular discipline; more than that he is apt to explain it entirely within

the frame of reference of his own specialty, rather than attempt an understanding of the problem using his own professional knowledge.

5. *Status, Access, Mobility*—"Among other things it requires the professional staff man to make quite clear to those he is in contact with exactly what he wants, what he means, and what he is going to do. He must carefully avoid creating fears, uncertainties, or resentments in the minds of the people with whom he deals." This is with reference to the fact that the professional may, at various levels of the organization because of his contacts and communication channels with upper levels of management, appear as a threatening figure to different people with whom he is working within the organization.

6. *Birds-of-a-Feather*—Here reference is made to the tendency for professionals to group together with other members having the same background, perhaps over lunch. As a result the professional is considered more or less isolated from the other people.

Medical Care Administration

Asa Barnes, M.D.

Socialized Medicine, Ten Years Old: What We Can Learn from England's Experiment. D. Cook.* Harpers Magazine 218:32 (May) 1959. (*Chief, London Bureau, New York Herald Tribune)

Ten years after the establishment of the British National Health Service it is difficult to find an opponent of "socialized medicine" left on the island. Ninety-seven per cent of the population are registered patients of the Health Service and never pay any medical bills. Out of 49,000 doctors, only about 600 rely solely on fees from private patients. On the 10th anniversary of the establishment of the service the *British Medical Association Journal* was full of praise of it from the leaders of the medical profession. Doctors, administrators, civil servants, and politicians all agree that the structure of the system is basically sound.

In Britain you do not pay for medical care, no matter who you are or how complicated your problem is or how long you have to stay in a hospital. All you have to do to acquire a family doctor is to go to any local post office for a list of Health Service doctors in the area. You may sign up with any of them, and you may change your mind if not satisfied. The doctor may turn you down if he feels he has enough patients on his list. If you need hospitalization surgery, or special consultation, your doctor will make arrangements just as in private practice. Physicians have an average of about 2,200 on their panel and are paid a capitation fee. Hospital surgeons, consultnts, and specialists are paid a salary. The cost has been a major target of critics, but, in terms of cost per head of population, it is less than $50 per person for complete medical and hospital care.

The middle class needed the Health Service most and has profited most. What has been done here by democratic process in a free society is a great step forward and an object lesson for democracy throughout the world.

Abstracts

Labor Calls the Shots on Health Service. H. Becker.* The Modern Hospital 86:85 (Jan.) 1956. (*Northwestern University Medical School, Chicago)

Unions generally initiate employee health benefit programs, but the views of management are becoming increasingly important. Management is going to become more concerned with the factors that affect the cost of health benefits and how these factors may be offset by more efficient and effective use of funds. With respect to health programs, union leaders are all concerned with essentially the same problems and have essentially the same objectives. Realistically the problem must be viewed from a national perspective.

Most unions have a noncontributary health program as their goal and favor a nonprofit community prepayment plan. There is little or no support for the insurance company cash indemnity approach. Every union official from whom the author secured information for his paper expressed as a primary objective labor's desire for "comprehensive" protection. Existing tensions between organized medicine and organized labor will not be eased until the problem of "service" benefits is resolved to their mutual satisfaction. Labor pressure for the closed panel approach and for union-operated clinics stems from the desire for comprehensive protection. If voluntary prepayment should become unresponsive to union, employer, and public demand for improved protection at the lowest possible cost, government intervention will occur. The danger is that too much satisfaction will be found in how far the prepayment plans have come.

Impact of Union Welfare Funds on the Practice of Medicine. L. S. Reed.* J. Nat. M. A. 48:389 (Nov.) 1956. (*Public Health Service, Department of Health, Education and Welfare, Washington, D. C.)

The author describes health and welfare plans in general, then considers welfare funds as a particular type of such plans. He points out that 92% of all workers covered for various health benefits are covered under employer-administered plans. The remaining 8% are covered under joint-managed or union-administered welfare funds. Of these, over 90% are under joint-managed funds, leaving less than 1% under union-administered funds.

What labor wants in the health care field is (1) comprehensive coverage of health services, (2) service benefits, (3) assurance of high-quality care, and (4) care at as reasonable cost as possible consistent with fair remuneration to those providing service. Reed concludes that the element added when labor unions develop health benefit programs is that substantial groups of consumers become organized and can more effectively

determine what they want and move more effectively to attain those objectives. The activities of labor unions will confront the medical profession with new problems and challenges to traditional and accepted ways, but the impact should be wholesome and beneficial for the public and the medical profession.

Hospital Costs Relate to the Supply of Beds. M. Shain* and M. I. Roemer. Mod. Hosp. 92:71 (April) 1959. (*Sloan Institute of Hospital Administration, Graduate School of Business and Public Administration, Cornell University, Ithaca, N. Y.)

Hospital beds that are built tend to be used. Within limits, general hospital beds are occupied at about the same rate regardless of whether there are few or many beds per thousand population. There is a vast reservoir of conditions in the population of every community that could benefit from hospital service. With widespread insurance the kind of cases that are hospitalized reflect the number of beds provided in the community. This is not to say hospital service is "abused." These conditions of lesser severity can be diagnosed and treated more effectively within a hospital.

There must be some desirable limit to the bed supply, but it is not known. The United States now has 3.8 beds per thousand population available but could hardly accommodate all the patients who could benefit from present medical knowledge. Further scientific advances will bring still more conditions within the scope of hospital treatment. We shall have to decide what proportion of our resources is to be devoted to hospital and medical care. Given extensive prepayment bed supply regulates the volume and kind of conditions that receive hospital care. The ultimate control over money spent for hospitalization therefore, is the volume of beds provided in the community.

Internal Medicine

Shermer H. Stradley, Jr., M.D.

Subdural Hematoma in the Elderly Patient. P. Stuteville* and K. Welch, J.A.M.A. 168:1445-1449 (Nov. 15) 1958. (*University of Colorado Medical Center, Denver)

In elderly patients subdural hematoma may mimic vascular disease, senile degeneration of the brain, and other conditions which make the diagnosis difficult.

The authors reviewed the hospital records of 75 patients 65 years of age or older who had proved subdural accumulations responsible for mental disability, physical disability, or death. They hoped by this study to make it possible to distinguish subdural hematoma from other conditions. From the study, they were able to define a variety of clinical conditions sometimes associated with the disease.

1. The patient has a definite history of initiating injury, he tends not to improve or may do so slowly but incompletely. He remains or becomes confused, demented or somnolent and develops neurological signs.

2. This situation involved the majority of the authors' patients. A history of trauma is sometimes not elicited, or is denied. If recalled, the injury was trivial. These patients are treated for this senility plus their "stroke," pulmonary disease, heart failure, enlarged prostate, and other obvious physical findings. The patient, however, becomes somnolent or comatose. Bedford, has stressed the difficulty of diagnosing subdural hemorrhage by pointing out that 80% of 5,000 elderly persons admitted to the Oxford Geriatric unit were confused, no matter what the diagnosis.

The authors conclude that, despite the lack of easy solution of the problem, a high degree of suspicion of subdural hematoma in elderly patients on the part of physicians may result in earlier diagnosis by resorting to earlier angiography or exploration.

Diagnosis of Peripheral Arterial Emboli of the Extremities. J. T. Phelan* and W. P. Young, J.A.M.A. 168:1299 (Nov. 8) 1958. (*1300 University Ave., Madison, Wis.)

The onset of acute peripheral arterial embolus is usually thought to be sudden, with excruciating pain followed by numbness, pallor of the extremity, and absence of pulsations. The authors studied 30 cases and found the onset to be abrupt in only 18. Others presented with atypical symptomatology, such as numbness of the extremity instead of pain. In one patient, motor weakness of a specific group of muscles was the first indication of arterial embolus. In this group of patients, pallor of the extremity was an early event; it was followed by cyanosis. The finding of absent or diminished pulsation was accompanied by color and temperature change.

Muscle ischemia is apparently not the sole mechanism causing pain in arterial embolus; dilatation of the artery by the embolus may be an additional factor. In those instances where pain is insidious or where paresthesias precede or replace pain, the dilating factor may be absent and the arterial lumen only partially occluded. Richards believes that arterial spasm has been overemphasized as the cause of pain in arterial occlusion.

In this series of 30 patients, the authors found 29 to have cardiac abnormalities. The presence of auricular fibrillation, mitral valvular disease, recent myocardial infarction, and congestive heart failure in patients with atypical motor or sensory disturbances of an extremity should suggest the possibility of arterial occlusion.

Current Status of Steroid Therapy in Rheumatic Disorders. J. S. Stillman,* New England J. Med. 259:820 (Oct. 23) 1958. (*Harvard Medical School, Boston)

The steroids may be used in replacement therapy as in Addison's disease; as such, they act as a specific. They may also be used in a nonspecific manner in many diseases that are not hormonal.

They may be classified as (1) anti-inflammatory, (2) antiallergic, (3) antitoxic, and (4) regulatory.

The most frequently observed undesirable side-effects, especially when the hormones are administered in doses large enough to suppress the signs and symptoms of nonhormonal diseases, are fluid retention, peptic ulcer or dyspepsia, emotional disturbances, facial rounding, acne, and hypertrichosis.

Chronic hypercortisonism occurs in patients who have had a prolonged mild overdosage of the hormones. The onset is insidious, characterized by fatigability, muscular and joint aching, and emotional instability. It is of interest that Slocumb discovered that in 14% of 128 patients with this syndrome, signs and symptoms of lupus erythematosus, including the presence of L. E. cells, developed.

The author discussed ways of avoiding side-effects, such as intra-articular injection and the proper use of this method. He discusses the use of steroids in rheumatic diseases, in systemic lupus, scleroderma, dermatomyositis, and polyarteritis nodosa.

Newer compounds are mentioned which are free from sodium- and water-retention and potassium loss, but the author points out that it is premature to determine that other effects, such as peptic ulcer, osteoporosis, and emotional disturbances, have been decreased.

Neurological Syndromes Associated With Carcinoma: The Carcinomatous Neuromyopathies. Lancet 2:971 (Nov. 8) 1958. (Neurological Department, London Hospital, London, England)

The authors have continued to see a considerable number of patients with various neurological disorders in association with carcinoma with no secondary deposits. Carcinomatous neuromyopathy is the term used to describe the whole group. The classification of the neurological disorders is (1) cortical cerebellar degeneration, (2) mixed forms, (3) secondary neuropathy, (4) peripheral neuropathy (sensorimotor), and (5) neuromuscular disorders. The sites of underlying carcinomas were (1) lung, (2) ovary, (3) prostate, (4) rectum, (5) breast, and (6) uncertain. No carcinomatous neuromyopathy was seen associated with carcinoma of the uterus or esophagus.

In the diagnosis of peripheral neuropathy (sensorimotor), occult carcinoma should be considered. When cerebellar symptoms predominate, other forms of cerebellar degeneration and multiple sclerosis must be ruled out. The neuromuscular disorders are difficult to differentiate; in these instances one must consider myasthenia gravis, motor-neuron disease, thyrotoxic myopathy, and dermatomyositis.

The authors review each type of neurological disorder, discuss the investigations they have made, and the theories of causation such as carcinotoxins, infection, sensitization, metabolic, and endocrine disorders.

It is concluded that although the etiology of these neurological syndromes associated with carcinoma is obscure, further study may illuminate both the nature of cancer and the relation between the nervous system and the rest of the body.

Abstracts

Noise and Hearing

Horace O. Parrack

Relative Intensities of Sounds at Various Anatomical Locations of the Head and Neck during Phonation of the Vowels. H. M. Maser* and H. J. Oyer. J. Acoust. Soc. America 30:275 (April) 1958. (*Department of Speech, The Ohio State University, Columbus.)

In some situations where conventional microphones cannot be used to transmit speech for communication purposes it would be desirable to use a bone or body transducer to pick up and transmit the signals. It is then important to know where the transducer can be located to achieve most effective pick-up of speech signals. In these studies, the sound was picked up at 16 sites on the neck and head while the subjects intoned 12 different vowels. The relative intensities of the sound were determined for the 16 pick-up sites. The results may be summarized as follows: (1) Except for the region at the top and center of the head, the intensity of vocally produced sound decreases as the distance from the larynx increases; and (2) anatomical locations on the neck and head can be arranged in four rather distinct regions according to the relative intensities of the vowel sounds generated.

Intelligibility of Known and Unknown Message Sets. I. Pollack,* H. Rubenstein, and L. Decker. J. Acoust. Soc. America 31:273 (March) 1959. (*Operational Applications Laboratory, AFCRC, Bolling AFB, Washington, D.C.)

In this study, the effects of "frequency of occurrence" of words (in everyday usage) upon the recognition of the words by listeners were examined when the words were presented in noise. In the study, the effects of "frequency of occurrence" were determined when (a) the specific words under test were initially unknown to the listeners and (b) when the specific words under test were known to the listeners. When the words in the message sets were unknown to the listener, significant effects of "frequency of occurrence" of the words were found; but these effects disappeared when the words contained in the message sets were known to the listeners. The detailed data are contained in 3 tables and 10 figures. The significant points for maintaining voice communication in industrial noise are as follows: (1) The words used should be well known to the users; (2) the number of words used should be minimized (small message sets); (3) when new words must be used, the workmen should become familiar with the words before they are used in the noisy work area; (4) new personnel should familiarize themselves with all words essential for voice communication on the job, before they actually work in the noises; and (5)

new employees should be trained to listen for and detect words in noise before they actually work in the noise.

Temporary Threshold Shift as a Function of Noise Exposure Level. W. J. Trittipoe.* J. Acoust. Soc. America 30:250 (April) 1958. (*Operational Applications Laboratory, AFCRC, Bolling AFB, Washington, D.C.)

The temporary shifts of threshold hearing level (TTS) for test tones of 4,000 and 6,000 cps were measured, using automatic audiometry, after one minute and three minute exposures to varying levels of wide band noise. The over-all sound pressure levels (SPL) of the broad band noise used were 108, 113, 118, 123, and 128 db. The TTS at 4,000 cps, after one minute of exposure, increased from about 3 db when SPL was 108 db to about 7 db when the SPL was 128 db and where the TTS was measured six minutes after cessation of the noise exposure. Where the noise exposure lasted three minutes and the TTS was measured six minutes after the noise exposure, the TTS was about 7 db when the SPL was 108 and increased to about 20 db when the SPL was 128 db. The TTS for a 6,000 cps test tone measured 7.5 minutes after exposure was almost the same as that for the 4,000 cps test tone measured six minutes after three-minute exposures to noise at the same levels. In addition, the TTS for 4,000 cps was measured at varying times after cessation of the noise exposure. Fifteen seconds after cessation of exposure the TTS measured for 128 db SPL was 63 db, for 123 db SPL was 44 db, for 118 db SPL was 41 db, for 113 db SPL was 25 db, and for 108 db SPL was 15 db. The recovery from TTS, with time after cessation of noise exposure, was the more rapid the greater the initial TTS. Thus, for a TTS of 63 db fifteen seconds after exposure the recovery was such that the TTS 10 minutes after exposure was 18 db, a recovery of 45 db. When the TTS 15 seconds after exposure was 15 db the recovery was such that the TTS 10 minutes after exposure was 8 db, a recovery of 7 db. These experiments show that the amount of TTS is a function of both noise exposure level and time of exposure, while the recovery from TTS with time after exposure depends greatly on the initial magnitude of the TTS.

Limits of Direct Speech Communication in Noise. J. M. Pickett.* J. Acoust. Soc. America 30:278 (April) 1958. (*Operational Applications Laboratory, AFCRC, Bolling AFB, Washington, D.C.)

Because the high noise levels in many military and industrial situations seriously limit unaided direct communication by speech signal, it is of interest to establish the maximum noise levels in which communication is at all possible. These experiments were performed in two noise spectra, one relatively flat from 200 cps to 8,000 cps and the second containing most energy in the frequency region 200 to 500 cps, with the energy level falling off rapidly as the frequency increases. A series of experiments on direct communication by speech were performed in these two noise spectra and varying over-all sound pressure levels. The results may be summarized as follows: If the distance between speaker and listener in 1 meter in a free field and the spectrum of the noise is flat, then 90% of sentences can be heard correctly with a noise level of about 95 db (vocal level 95 db; signal to noise ratio = 0 db at listener). If the noise field contains most energy at low frequencies, 90% of sentences can be heard correctly in a level of about 105 db (vocal level 97 db; signal to noise ratio −8 db at listener). These represent upper limits for reasonably adequate communication, when the speaker shouts and is separated from the listener by about 3 ft. If the language and context can be kept very simple, an increased noise level of 50 to 10 db might be tolerated. However, adequate communication with a reasonable degree of effort and comfort, over a long time period, cannot be carried on at these high noise levels.

Industrial Hygiene

Edward C. Riley, M.D.

Air-Borne Castor-Bean Pomace Allergy: A New Solution to an Old Problem. R. L. Kathren,* H. Price, and J. C. Rogers. A.M.A. Arch. Indust. Health 19:487 (May) 1959. (*Los Angeles City Health Department)

The authors here present a somewhat unusual solution to any air pollution problem in an industrial setting. The commonly used methods of extracting castor oil from castor beans—(1) the solvent extraction and (2) mechanical crushing, grinding, and pressing—are described, since they present different environmental hazards. The solvent extraction leaves a residue which is dryer and dustier than the residue left from the mechanical extracting process. This residue, called pomace, has been identified as a frequent source of allergic-type responses in people coming in contact with it.

In the investigation of four cases of disabling asthmatic bronchitis in a pipe reconditioning plant employing 70 persons, no internal industrial exposure was identified.

"Suspicion was directed toward a fertilizer plant located across the street about 250 yd. from the pipe company, which just recently had started sacking castor-bean pomace."

The authors concluded "(1) that this outbreak was directly attributable to the castor-bean pomace used by the fertilizer plant; (2) that subvisible particulate castor-bean pomace was being carried for a distance of about 250 yd. into the yard of the pipe company by the prevailing winds." In this instance substitution of a less dusty pomace

obtained from the mechanical extraction of the castor oil appeared to solve the air pollution problem, since the recurrence of symptoms in the pipe-reconditioning plant was reduced after the substitution was made.

Oxides of Nitrogen: Their Occurrence, Toxicity, Hazard. E. LeB. Gray.* A.M.A. Arch. Indust. Health 19:479 (May) 1959. (*Rochester, N. Y.)

This article is an attempt to remove some of the confusion surrounding the hazard associated with "nitrous fumes," or more correctly designated as oxides of nitrogen. After listing eight oxides of nitrogen and discarding N_2O as a not significant hazard in this connection, the author states that the problem resolves itself into a comparison of the toxicities of (A) NO and (B) NO_2 in equilibrium with N_2O_4.

After pointing out the discrepancies in both animal and human experience, the author concludes "the most likely answer seems to lie in the facts that the toxicity of gaseous mixture is roughly proportional to the amount of NO_2 present and that sources of gas which produce most NO_2 show greater toxicity than sources from operations which produce large quantities of NO in the oxide mixture." Elkins has attempted to separate the NO and NO_2 from various operations and shows values of NO_2 varying from nine to 52%. The author feels that there is need for more work with NO_2 and also with pure NO as a starting material. He points out, however, that NO gradually oxidizes to NO_2 and so there is always a small amount of NO_2 present.

The Industrial Hygiene of Uranium Fabrication. W. B. Harris* and I. Kingsley. A.M.A. Arch. Indust. Health 19:540 (May) 1959. (*Health and Safety Laboratory, U. S. Atomic Energy Commission, New York Operations Office, New York City.)

This report sums up a considerable experience obtained in a variety of industrial operations in addition to laboratory studies on the toxicity of uranium. For the sake of this discussion, the toxicity of soluble uranium compounds on the kidneys is ignored and the effects of insoluble particles which gain access to the lung has been evaluated. All exposures have been expressed in disintegrations per minute per cubic meter since it is the local effect on the lung of the ionizing radiation which is the most serious hazard from the insoluble particulate material.

"The various procedures which have been followed include the following: (1) rolling, (2) forging either by means of a hammer or press, (3) extrusion, (4) drawing, (5) swaging, (6) machining, and (7) powder pressing. Inasmuch as uranium is a material that reacts rapidly and easily with oxygen, substantially all processing where heat is generated can result in air-borne dispersion. This oxidation is not confined to the heating and rolling operations; on the contrary, the oxide forms continuously and spontaneously flakes off the metal at temperatures above 600° F. Any vigorous working of the metal produces a temperature rise which may initiate oxide formation, flaking, and subsequent air-borne contamination."

While the air-borne concentrations have been measured and evaluated from the point of view of industrial hygiene exposures, considerable discussion is included of housekeeping and control of fire hazard as well as ventilation to control the air-borne particulate matter.

Generally in processing uranium metals, some form of coating is required to reduce the rate of oxidation. "The loss of material inherent in the use of gas-fired furnaces and the health problems subsequent to such loss have resulted in the introduction of both lead and salt-bath furnaces. The most satisfactory method for heating uranium billets at the present time is in a molten salt bath. Mixtures of lithium and potassium salts are used. The salt bath effectively prevents oxidation of the metal in the furnace, and, if the metal can be kept coated completely, controls oxidation throughout the remainder of the rolling cycle."

Many samples were taken of the dust associated with these operations, and several tables are given indicating the magnitude of the personnel exposure. It is apparent from the concentrations presented that many of the operations require specific control measures to permit the safe handling of these materials.

Special attention is given to scrap recovery since most uranium fabrication operations will require the recovery of the valuable scrap metal removed during the machine. In handling of scrap, the oxidation problem and rate are particularly troublesome. "Uranium powders are spontaneously pyrophoric and must be handled with caution. Scrap materials from powder operations should not be stored, but should be reacted in some way." Generally the scrap is converted to the oxide, which is packed in drums and shipped to scrap processing centers. Although this reduces the fire hazard from oxidation of scrap, the health hazard from inhalation of uranium oxide dust still persists and adequate control must be provided.

The disposal of contaminated liquids should also be considered by anyone planning to go into this type of operation. "When it is uneconomical to think in terms of recovery of this material, it is usually advisable to filter or decant so as to upgrade the solids content for recovery and to permit the uranium-bearing solutions to be disposed of through normal liquid waste disposal channels." Under general health and safety controls specific recommendations have been made under housekeeping, personal protection, and fire protection. Under personal protection the authors specifically discuss radiation protection, respirators, eating, splash protection, and air cleaning prior to discharge of the contaminated air outside of the building. This is a rather complete discussion of the hazards from uranium fabrication

Abstracts

and is a condensation of an internal report of the Health and Safety Laboratory, U. S. Atomic Energy Commission designated HASL-39.

Dermatology

Leo J. Miedler, M.D.

The Treatment of Dermatomycoses with Orally Administered Griseofulvin. H. Blank* and F. J. Roth Jr. A.M.A. Archives Dermat. 79:259 (March) 1959. (*University of Miami, School of Medicine, Miami, Fla.)

Following recent reports on the successful oral treatment of animal dermatomycoses with griseofulvin, an antibiotic isolated from Penicillium griseofulvin, Blank and Roth initiated an exploratory study in man. Experiences with 31 cases led to the provisional conclusions that griseofulvin is able to produce a favorable response in mycoses caused by various species of dermatophytes. Of note is the fact that 17 of the 31 cases were Trichophyton rubrum infections, most of which had been present for several years. Although details of therapy have not yet been finalized, it would seem that the duration of treatment with approximately 1 gm of the drug per day will depend on the time required for the normal replacement of infected tissues. Thus tinea corporis has cleared in one to two weeks, tinea pedis in three to four weeks, tinea capitis in one month or thereabouts, and onychomycosis in three to four months. Infections caused by Malassezia furfur, Candida albicans, and Blastomyces dermatitidis did not respond to griseofulvin. Toxic reactions were minimal in therapeutic doses in man. Minor self-limited gastrointestinal distress, headache, and one case of an urticaria-like drug eruption are reported. The problem of relapse or recurrence, of course, remains to be evaluated.

The Epidemiology of Skin Cancer. E. J. MacDonald.* J. Invest. Dermat. 32:379 (Feb.) 1959. (*M. D. Anderson Hospital and Tumor Institute, Houston, Texas)

Retrospectively and statistically, an epidemiologist provides further confirmatory evidence of the adverse effect of solar radiation on the skin. A comparison is made between the cancer registries for El Paso County, Texas, and the state of Connecticut. In Connecticut from 1935 through 1946 there was a total of 3,597 persons with cancer of the skin. Only 3% had multiple primary skin lesions. For a similar 12 year period, but for the years 1944 through 1956, El Paso County had 3,601 cases of skin cancer in a population one-eighth as large. There were 2,848 persons with cancer of the exposed surfaces in the El Paso series. Of this number, 16.3% had multiple lesions. An attempt was made to determine the influence of skin pigmentation on tumor incidence by the admittedly somewhat less than ideal method of reviewing surnames. Utilizing this method, it was found that the skin of the head and neck was responsible for 35.8% of the total cancer among the Anglo-Americans in El Paso, for 8.3% among Latin Americans and for 7% among Connecticut residents. In El Paso, where occupations were recorded, half of the men were farmer-ranchers. Therefore, in a total population the high incidence of skin cancer of the exposed areas in more lightly pigmented individuals subjected to a high percentage of total possible sunshine (80%) at an altitude of 3,920 feet is epidemiologically affirmed.

Contact Dermatitis from 4-Tertiary Butyl Catechol in Thermo-Fax Paper. M. H. Matz* and I. H. Blank. New England J. Med. 260:1076 (May 21) 1959. (*Harvard Medical School, Cambridge, Mass.)

Confirming previous reports in an elegantly conceived study that utilized specially prepared samples from the company, Matz and Blank clearly demonstrated that 4-tertiary butyl catechol was the offending agent in a case of contact dermatitis to Thermo-Fax paper. Although the chemical was eliminated from this duplicating paper in 1958, the authors wisely alert the reader to the widespread use of the material in the plastics, petroleum, rubber, and paint industries.

The Influence of Pre-Exposure to Alkyl Benzene Sulphonate Detergent, Soap and Acetone on Primary Irritant and Allergic Eczematous Reactions. E. Skog.* Acta dermat-Venerol. 38:1, 1958. (*Karolinska Sjukhuset, Stockholm 60)

This investigation was designed to demonstrate clearly the effects of preexposure to alkyl benzene sulfonate detergent, soap, and acetone on primary irritant and allergic eczematous reactions in humans, guinea pigs, and rabbits. 2,4-Dinitrochlorobenzene served as both sensitizer and irritant. The indicated skins so prepared by graded preexposure to nonirritating concentrations of the synthetic detergent, soap, and solvent displayed a higher reactivity, either grossly and/or microscopically, to both allergic and irritant concentrations of 2,4-dinitrochlorobenzene. The author concludes that everyday substances such as detergents and solvents have a profound influence on primary irritant and allergic eczematous reactions, an influence which may well affect housewives and certain industrial workers.

A Screening Test for Anti-Inflammatory Activity Using Human Skin. J. A. Witkowski* and A. M. Kligman. J. Invest. Dermat. 32:481 (April) 1959. (*Hospital of the University of Pennsylvania, Philadelphia)

Pustule formation induced by croton oil on human skin may be suppressed by prior intradermal injection of a test substance. This principle is the basis of a screening method for detecting agents with anti-inflammatory activity. The test is performed by making an injection into the center of a circular test site and then immedi-

ately covering the area with a croton oil patch. After 24 hours pustule suppression is estimated to the nearest 25%. The test agents must, naturally, not in themselves produce inflammation. Advantages of the method include the small amounts of test material that are required, direct visualization, and completion in 24 hours. Unfortunately, the test procedure is appropriate only for agents with a fair degree of anti-inflammatory activity. The authors' report deals with steroids. Likewise, it will be somewhat hazardous to draw inferences about comparative topical activity from the pustule suppression test. It is entirely possible that an agent effective by injection might be totally inactive topically because of its failure to penetrate the skin.

Hula-Hoop Dermatitis. I. N. Holtzman.* A.M.A. Arch. Dermat. 79:590 (May) 1959. (*135 Eastern Pkwy., Brooklyn 38)

A case of an eczematous contact dermatitis of the palms of both hands caused by a hula-hoop is reported. The clinical impression was confirmed by positive patch tests with scrapings of the plastic material from the surface of three different-colored hoops which the patient used. Further investigative studies were not reported. The child's dermatitis responded admirably to the substitution of an aluminum hoop.

Clinical Toxicology

Lee H. Miller, M.D.

Transaminases in Serum and Liver Correlated with Liver Cell Necrosis in Needle Aspiration Biopsies. S. Zelman,* C. C. Wang, and I. Appelhanz. Am. J. M. Sc. 237:323 (March) 1959. (*Medical Service and Research Laboratory, Veterans Administration Hospital, Topeka, Kan.)

The transaminating enzymes glutamic-oxaloacetic transaminase and serum glutamic-pyruvic transaminase have been found in increased amounts in the serum in patients with many forms of liver disease. It is thought that the increases in the serum glutamic-oxaloacetic transaminase (SGOT) and the serum glutamic-pyruvic transaminase (SGPT) result from the destruction of liver cells, with the release of intracellular enzyme content into the plasma. In a previous study of patients with jaundice, it was observed that the degree of elevation of SGOT appeared to be related to the amount of cellular necrosis that was seen by microscopic study of liver biopsy specimens. A similar observation was made from a study of the livers from mice that were infected with hepatitis virus. Likewise, a similar correlation was found in an experiment with mice that were poisoned by carbon tetrachloride.

In this study, 143 needle aspiration biopsies of the liver were taken from 108 patients with real or suspected liver diseases that resulted from numerous causes. The extent of liver cell necrosis was compared with the serum transaminase values determined on the morning that the biopsy was obtained. An excellent correlation was found to exist between the extent of necrosis of liver cells in biopsy specimens and the rise in the activity of either transaminase in the serum. Both transaminase activities in the liver tissue biopsy specimens weer related inversely to the degree of necrosis of liver cells. Photomicrographs of the various grades of liver cell necrosis are shown.

A Follow-Up Study of Men Exposed to Cadmium Oxide Fume. J. A. Bonnell,* G. Kazantis, and E. King. Brit. J. Indust. Med. 16:135 (April) 1959. (*Department for Research in Industrial Medicine, The London Hospital)

The results of a repeat study of 100 men who were examined initially in 1953 after an exposure to cadmium oxide fume that was produced during the manufacture of copper-cadmium alloys are presented. At the time of the intial survey, chronic cadmium poisoning was diagnosed in 19 men who were working and in 4 men who were too ill to work. Of these, 11 had emphysema and proteinuria only, and 4 had emphysema alone.

The present study was carried out because of the development of additional cases of proteinuria at one of the factories. Twenty-four new cases with manifestations attributed to chronic cadmium poisoning were discovered. Of these, 5 had emphysema and proteinuria, 18 had proteinuria alone, and 1 had emphysema alone. The results of ventilatory pulmonary function studies indicated that the men who were exposed to cadmium had a greater loss of function with an increase in age than did those in a control group. Many of the men in the initial survey in 1953 who had emphysema showed progressive deterioration despite the fact that they had no further exposure to cadmium after 1953. The protein (molecular weight 20,000 to 30,000) found in the urine is specific for this disease. In addition to the proteinuria, a high incidence of glycosuria (19 of 82 men examined) was found. Seventeen of the men with glycosuria also had proteinuria. Because of these findings together with the production of tubular damage in rats and rabbits following repeated administration of small quantities of cadmium, it is believed that the findings are compatible with renal tubular damage and that progressive renal damage does follow prolonged absorption of cadmium.

The Biological Actions of Vanadium: I. Effects upon Serum Cholesterol Levels in Man. C. E. Lewis.* A.M.A. Arch. Indust. Health 19:419 (April) 1959.

Previous investigations have demonstrated that vanadium has an inhibitory effect on cholesterol synthesis in vivo. Twenty-four vanadium workers and a control group of 45 persons from Colorado and Ohio were studied to determine what effects exposure to vanadium in work environments with attendant absorption of this element might have

on cholesterol levels. The study included a standardized medical history, and a subjective evaluation of alcohol and fat intake; a complete physical examination; a hematocrit determination; a urinalysis; a 12-lead electrocardiogram; determination of total cholesterol in the serum; and, determination of vanadium in the urine.

The group of workers exposed to vanadium had a mean concentration of 205 mg of cholesterol per 100 ml of serum, whereas the control group had a mean concentration of 228 mg per 100 ml of serum. A statistical technique employing a multiple regression equation was utilized to evaluate the possible effects on the cholesterol levels of factors other than vanadium, such as age, height, weight, alcohol intake, fat intake, and race. It was concluded that none of the factors was found to be related significantly to the cholesterol values observed for either the Colorado or the Ohio group. No abnormalities were found in the urine of the subjects that were studied. In the workers exposed to vanadium, the mean concentration of vanadium in the urine was 46 μg per liter as compared with 12 μg in the control group. No effect upon the hematocrit values was observed.

Tropical Hazards Associated with the Use of Pentachlorophenol. J. A. Menon.* Brit. M. J. 1: 1156 (May 17) 1958. (*Divisional Medical Officer, Third Division, Sarawak)

Pentachlorophenol (Santophen 20) or its sodium salt (sodium pentachlorphenate; Santobrite) is used as a wood preservative. The sodium salt is used as a preservative, fungicide, and disinfectant, and to prevent sap-stain in timber. It is readily soluble in water, stable, and practically odorless. In the operation described, the sodium salt was used to prevent sap-stain. A 1.5 to 2% aqueous solution was employed, and, on occasion, anhydrous sodium carbonate or borax was added to prevent precipitation of the pentachlorophenol by acidic timbers. After dipping, the wood was drained, and then the workmen, often without gloves or protective clothing, lifted and stocked the wood.

Nine deaths ascribed to pentachlorophenol occurred within a period of 18 months. The men who died had worked at the dip tank for periods of 3 to 30 days before they became ill. Death occurred rapidly after the onset of the illnesses, within 9 hours in six cases, within 16 hours in two cases, and in 25 hours in the ninth case. Prolific sweating, hyperpyrexia, dyspnea, and terminal spasm were noted. Abdominal symptoms were not as marked as those reported previously. The concentration of pentachlorophenol in the urine from the ninth case was reported to be 160 $\pm$ 10 ppm. Analyses of urine or tissue specimens from the other cases were either not done or were reported as "nil found." Members of the true native races (Dyak, Kayan, etc.) appear to be affected more frequently than the Chinese or Malay workmen. This, in the author's opinion, is because the Chinese eat a better diet, have a superior physique, and exercise much greater care in personal cleanliness. As a result of the deaths, protective clothing has been supplied, washing facilities have been installed, workers are required to drink a pint of milk daily, and they are rotated so that no one works more than 14 days at the tank. Since these measures have been instituted, no serious cases or deaths have been reported.

Radiation Health

Thomas S. Ely, M.D.

A Primer on Radiation Hazards for Physicians. R. E. Peterson,* J. G. Baron, M. Kent, and Titus C. Evans. A.M.A. Arch. Int. Med. 103:308 (Feb.), 1959. (*State University of Iowa, University Hospitals, Iowa City)

A scientific exhibit at the 43rd Annual Meeting of the Radiological Society of North America included information on the definition of radiation units, sources of radiation, consequences of radiation, and solutions. "Roentgen," "rep," "rad," "rem," "gm-r," or "gm-rad' may be used in the appropriate instance to quantitatively describe a radiation dose. Radiation to members of the population comes from natural sources, from nuclear fall-out, from medical x-rays, and from occupational exposure. The last includes medical x-ray exposure to persons such as radiologists and x-ray technicians during the course of their work. Analysis of various data on the numbers of x-ray examinations made and the typical exposures for each examination permits the estimation of an exposure of 5,000 gm-r per person per year averaged over the entire population of this country. Natural radiation and medical x-rays contribute most of the population dose. The former cannot be avoided; the latter could be reduced through a combination of education, better technique, legislation, the keeping of health records, and a revision of medical usage.

The Clinical Radiologist and the Problems of Radiation Hazards. W. G. Scott.* J.A.M.A. 170:421 (May) 1959. (*100 N. Euclid Ave., St. Louis)

That diagnostic radiology has been of great benefit to the practice of medicine can be pointed up by the current annual use of 118,000,000 sheets of x-ray film, and 189,000,000 packets of dental films that are exposed by 128,000 x-ray machines. The vast increase in the use of diagnostic roentgenography over recent years has been concurrent with considerable increase in life span, drop in infant mortality, and other evidences of increasing population health, and has not been accompanied by any obvious deleterious population effect. However, it is known that x-rays can cause somatic effects, such as life-shortening and leukemia, and genetic effects, almost all of which are undesirable. Fortunately, most of the gonadal exposure results from only about seven types of examinations, comprising a minor percentage of all examinations performed. Therefore, special attention can be given to dose

reduction for these procedures. The use of several suggested measures can permit the reduction of gonadal dose by 75% to 85%.

Certain Structural Aspects of Lymphocytes and Monocytes in Relation to the Clinical Condition of Persons Exposed to Ionizing Radiation. D. O. Shiels.* Brit. J. Radiol. 32:306 (May) 1959. (*Hawthorn, Victoria, Australia)

Certain hematological indices have been found to correlate better with symptomatology in persons exposed to ionizing radiation than do any of the usual simple blood element counts. These special indices are various ratios of the counts of large lymphocytes, small lymphocytes, monocytes, lymphocytes containing cytoplasmic granules, and type "B" monocytes. Determinations were made on persons exposed to ionizing radiation during "well" and "not well" periods. Most of these were x-ray technicians or radiographers. One had had radiation therapy. The average difference of the most significant single cell count was 1.35 to 1, whereas the average difference of all of the special indices was higher, one of them being 10 to 1. Although actual radiation doses were not known, statistical analysis showed a "highly significant" correlation with the symptomatic state.

Comments on the Labor Relations Aspects of Nuclear Energy. C. F. MacGowan.* Health Physics 1:442 (March) 1959. (*1837 Crestwood Ave., Munster, Ind.)

While not all joint management-labor safety programs are necessarily successful, all successful programs are joint. As recently as three years ago, nuclear hazards constituted a minor consideration in bargaining agreements. However, radiation safety programs have increased and will continue to increase in importance in labor negotiations. The over-all injury frequency and severity rates for the atomic energy industry have been good under close federal control. Perhaps this is because of the considerable emphasis and money devoted to radiation safety. Labor is concerned that, if the federal government releases its supervisory control, normal industrial competition will result in economically necessary "corner-cutting" in the area of radiation health. Related to this is the concern that the states do not have satisfactory compensation provisions. A report is cited which indicates that only about 19 states had the bare necessities of basic radiation coverage in their laws.

Radiation Hazards Associated with Dental Roentgenography. W. E. Nolan* and S. Block. Indust. Hyg. J. 20:118 (April) 1959. (*University of California, Lawrence Radiation Laboratory, Livermore, Calif.)

A survey of dental x-ray machines in the San Francisco area showed that in many cases not only the patient and technician, but people outside the diagnostic room, were receiving radiation doses larger than necssary to produce good roentgenograms. The main shortcomings of these installations were poor collimation, inadequate filtering and tube shielding, slow film, short timer cord, and inadequate shielding of the room. In addition, some technicians held the film during exposure. The inadvisability of the last technique is vividly illustrated by pictures of serious burns that have been produced thereby. Remedies are apparent and straightforward. An educational effort by a special committee of the local dental association resulted in improvements in equipment and technique, with consequent reduced exposures.

Reparative Surgery

Robert J. Trettin, M.D.

Diagnostic and Prognostic Factors in Abdominal Trauma. R. D. Williams and R. M. Zollinger. Am. J. Surg. 97:575 (May) 1959.

The authors report a series of 200 consecutive abdominal injuries between 1947 and 1958. At Ohio State University Hospital a general surgeon is responsible for an over-all evaluation of the seriously injured patient.

The most frequently observed injuries were to the urinary tract (76) and intestinal tract (67). One in five was an injury to the spleen. Of the 200 patients, 80 had serious extra-abdominal injuries involving the extremities, head, and thorax.

Nonpenetrating abdominal injuries present the greatest diagnostic challenge. Repeated careful evaluation of the abdomen in patients with multiple injuries is of the greatest diagnostic importance. If these patients who were unconscious on admission are excluded, abdominal tenderness was noted in 86% of the conscious patients with injury to the intra-abdominal organs. Abdominal pain and the finding of intraperitoneal blood or fluid by needle paracentesis were of more help than the leukocyte count or roentgenogram. X-ray studies were of diagnostic help in only one-third of the cases. Evaluation of the leukocyte count was seen more frequently with rupture of the spleen than with other injuries.

The mortality in the 200 cases was 13.5%. Two-thirds of these had multiple serious injuries. Severe shock, unconsciousness, and delay in diagnosis and treatment of the abdominal injury were frequent in the patients who died.

Basic Concepts About Shoulder-Arm Syndrome. J. W. Pender.* J.A.M.A. 169:795 (Feb. 21) 1959. (*Department of Anesthesiology, Palo Alto Medical Clinic, Calif.)

The shoulder-arm syndrome is a psychosomatic disease with an anatomic or physiological component and a psychological or psychiatric component. It is a painful disability which may follow even a trivial cause, such as a sprain, laceration,

or simple fracture. After appropriate treatment of the original disability, the patient continues to have a swollen, discolored, tender, painful, functionless arm and hand.

An accurate diagnosis must be made before initiation of treatment. Usually this is accomplished by exclusion of other possible pathologic states causing the sympathetic dystrophy. The most useful test in establishing the diagnosis is the injection of a short-acting anesthetic agent about the stellate ganglion on the affected side. Symptomatic relief for the expected duration of the block is good evidence that sympathetic dysfunction contributes to the disability.

The author emphasizes that the physician who has gained the patient's confidence by exhibiting genuine interest, sympathy, and encouragement toward the patient as an individual will be most successful in treating both components of the shoulder-arm syndrome.

Ancillary Care in Postphlebitic Syndrome. Harold Laufman.* S. Clin. North America 39:183 (Feb.) 1959. (*Northwestern University Medical School, Chicago.)

The ancillary care in postphlebitic syndrome consists of the intelligent application of basic principles of elevation, cleanly care, and compression. The author details the pathogenesis and outlines the treatment of this syndrome. He believes that the use of expensive medicated ointments, local antibiotics, or other local medications is not indicated provided the simple measures described are properly employed.

The major problem in early treatment is the control of edema. Late complications, including chronic induration, dermatitis, secondary varicosities, and ulceration usually necessitate surgical procedures, mainly consisting of removal of the varices. Rarely, excision of a local ulcer with or without skin grafting is required. The judicious employment of ancillary care prior to and following operative treatment frequently makes the difference between success and failure. All care in the postphlebitic syndrome must be considered supportive rather than curative, since the cause is not eradicated. As a rule, the patient with a postphlebitic syndrome must take precautions for the remainder of his life, but with proper care he can be kept symptom-free.

Penetrating Wounds of the Stomach, Duodenum and Small Intestine. L. W. Wolff* and W. Philip Giddings. S. Clin. North America 38:1605 (Dec.) 1958. (*United States Army Hospital, Fort Benning, Ga.)

Suspected penetrating or perforating wounds of the stomach, duodenum, or small intestine must be regarded as surgical emergencies requiring a prompt decision regarding operative intervention. A brief history and pertinent physical examination, the passage of a Levin tube, a rectal digital examination, urinalysis, and chest and abdominal x-ray examinations are essential. However, the decision for or against operation is made largely on a clinical basis.

Wounds of the stomach, duodenum, and small bowel vary from small puncture wounds to transections and require prompt closure with restoration of continuity and with adequate luminal diameter. Gastric wounds with leakage are complicated by a rapidly developing chemical peritonitis. These wounds are frequently thoracoabdominal, and their repair is possible by thoracotomy and transdiaphragmatic approach. The authors emphasize that closure of small gastric wounds with purse-string sutures is contraindicated because of the danger of delayed post-operative hemorrhage.

Resection and anastomosis for wounds of the duodenum, jejunum, and ileum should not be performed if simple two-layer closure can be done without excessive constriction of the lumen.

Experimental Toxicology

R. E. Eckardt, M.D.

Zinc Toxicity in the Rat and its Interrelation with Copper. D. R. Grant-Frost and E. J. Underwood. Australian J. Exper. Biol. M. Sci. 36:339, 1958. Chem. Abst. 53:3474c (Feb. 25, 1959)

A level of 0.5% of Zn, as ZnO, in the diet of rats reduced markedly the growth, food consumption, hemoglobin levels, Cu retention, and body fat content of the animals. The addition of 0.4 μg. Cu daily to the diet of Zn-fed rats was found to have no effect on food consumption, to improve growth slightly, to maintain the Cu contents of blood and tissues at normal levels, and to afford considerable protection against anemia. It is concluded that (*a*) the growth-depressing effect of Zn is caused largely but not entirely by reduced food consumption, probably due to the unpalatability of the Zn diet; (*b*) anemia is caused by a Zn-induced Cu deficiency; and (*c*) Zn profoundly reduces Cu concentration in blood and tissues and probably antagonizes absorbed Cu at the cellular level. The importance of the nature and timing of Zn and Cu supplements to a proper understanding of Zn-Cu interrelations is stressed.

Endocrine Organs in Experimental Poisoning with Benzene. P. R. Nello* and S. Caltabiano. Folia Med. (Naples) 41:1162, 1958. (Chem. Abst. 53: 5511b, March 25, 1959) (*University of Pisa, Italy)

Rabbits received 1 cc/kg of equal parts olive oil and benzene intramuscularly every other day. Total doses below the level producing aplastic myelosis caused marked changes in the endocrine organs. Histological changes were neglible in the pituitary and pancreas, but were most marked in the thyroid, adrenal cortex, thymus, and testicles. In the latter, the damage was limited to the germinative tissue without affecting interstitial layers.

Blood Components in the Dog: Normal Values. M. H. Carr* and P. R. Schloerb. J. Lab. & Clin. Med. 53:646 (April) 1959. (*University of Kansas School of Medicine, Kansas City, Kan.)

Normal values for blood components (serum electrolytes, nitrogenous constituents, protein components, and body compartments) of dogs and humans are compared and tabulated.

Studies on the Promoting Action of Tween 60: The Biological Behavior of the Tumors Induced. G. Della Porta,* G. Pietra, B. Terracini, and P. Shubik. Am. A. Cancer Res., Proc. 3:16 (March) 1959. (*Chicago Medical School)

A detailed morphological study was conducted of tumors induced by treating mice with a single initiating dose of 9,10-dimethyl-1,2-benzanthracene (DMBA) followed by treatment with Tween 60. Many of the tumors regressed. Mice treated with a series of DMBA doses of 50-1,000 μg. were compared with those in the Tween series. Also, mice were treated with a single dose of carcinogen followed by Tween 60 treatments which were delayed for periods up to 25 weeks. Even after this time, promotion still occurred, confirming that initiation is irreversible. Promotion studies with 20-methylcholanthrene and 3,4-benzpyrene are also reported.

The Excretion of 3,4-Benzpyrene and Other Aromatic Polycyclic Hydrocarbons in the Bile of Rats Following Intravenous Administration. H. L. Falk,* P. Kotin, and R. Busser. Am. A. Cancer Res., Proc. 3:18 (March) 1959. (*University of Southern California School of Medicine, Los Angeles)

At least eight metabolites can be detected in the bile of rats following intravenous injection of C^{-14}-labeled 3,4-benzpyrene. Certain ones disappeared within two hours, while other appeared or became dominant after this interval. 8-Hydroxybenzpyrene was identified, despite its identification by others as a major metabolite in the feces of rats. About 80% of the injected dose in protein solution was recoverable in the bile within 3 hours, with smaller amounts being excreted over the following 21-hour period. The latter consisted of only two components which were present throughout the entire experiment in relatively constant amounts. Parallel experiments were performed with pyrene, fluoranthene, phenanthrene, anthracene, and 1,2-benzpyrene.

Synthetic Polyelectrolyte Polymers as Tumor-Inhibitors. W. Regelson* et al. Am. A. Cancer Res., Proc. 3:55 (March) 1959. (*Roswell Park Memorial Institute, Buffalo, N. Y.)

Synthetic polymers with 2- and 3-carbon repeating units, such as those derived from maleic anhydride copolymers, other polycarboxylic acids, and other polyelectrolytes, all possess potent tumor-inhibiting activity (50% to 90%) against transplanted tumors (S-180, L-1210, P-288, Erlich-2, Krebs-2, and Walker 256) at nontoxic dose levels. Some of the polymers exhibited significant tumor-inhibitory effect when given three days prior to tumor inoculation. The tumor-inhibiting characteristics and toxicity of these polymers are related to molecular weight, chemical structure, and polyelectrolytic and other physicochemical properties.

Audioradiographic Studies on Connective Tissue Formed Around Imbedded Plastics. E. T. Oppenheimer,* M. M. Fishman, and M. Willhite. Am. A. Cancer Res., Proc. 3:49 (March) 1959. (*Columbia University Institute for Cancer Research, New York)

$Na_2S^{35}O_4$ was injected intraperitoneally into Wistar rats imbedded with polystyrene films for periods of 2 to 13 months and the pockets formed around the film removed 48 hours later. S^{35} uptake was higher in the fibrous tissue of the pocket than in the surrounding connective tissue. Also, there was always an intense layer of S^{35} activity in the area lining the pocket wall surrounding the film, which persisted even when histological findings showed a comparative quiescence and there was apparently reduced nuclear activity. The uptake of P^{32} paralleled the nuclear activity observed histologically, however.

Toxicity of Modern Tricresylphosphate. D. Henschler. Ztschr. f. Arbeitsmed. u. Arbeitsschutz. 8:265 (Nov.) 1958. (Occup. Hyg. Abst. 34:352, April, 1959)

The toxicity of modern tricresylphosphate preparations was studied by giving chickens varying doses of these chemicals which contain only 3.3% *o*-cresyl instead of about 30%, as in some older preparations. The doses were given six days a week for two months. It is concluded that the modern preparations on the whole are not very hazardous to man.

Metabolism of Cyclohexane-C^{14} and Cyclohexanol. T. H. Elliott,* D. V. Parker, and R. T. Williams. Biochem. J. 66:46P, 1957. (Chem. Abst. 53:7400g, April 25, 1959) (*St. Mary's Hospital Medical School, London)

In 48 hours after oral dosing with C^{14}-labeled cyclohexane, rabbits excreted about 50% of the radioactivity in expired air and 50% in urine. Cyclohexylglucosiduronic acid was isolated from urinary conjugated glucuronic acid (30% to 50% of dose); expired air contained mainly unchanged cyclohexane, but 10% of the dose was present as CO_2. The urinary metabolites identified are described. C^{14}-labeled cyclohexanol is converted mainly to cyclohexyglusociduronic acid and 71% radioactivity is excreted in urine within 48 hours. Rabbit metabolism of cyclohexane appears to be cyclohexane → cyclohexanol → cyclohexane-1,2-diol.

Experimental Tuberculopneumoconiosis. P. Gross,* M. L. Westrick, and J. M. McNerney. A.M.A. Arch. Indust. Health 19:320 (March) 1959. (*Industrial Hygiene Foundation, Mellon Inst., Pittsburgh)

The inhalation of large quantities of so-called "inert" dusts in combination with large intra-

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tracheal infecting doses of avirulent tubercle bacilli produced tuberculopneumoconiotic lesions in guinea pigs. Iron-contaminated, nonfibrogenic quartz was most active, silicon carbide the least, and aluminum oxide and kaolin midway in activity. It is concluded that this lesion is basically a chronic obliterative alveolitis with fibrous replacement of normal tissues. Central necrosis, if present, is a secondary phenomenon. The question is raised whether any dust exists even of the so-called inert type, which, in conjunction with a tuberculous infection, may not produce tuberculopneumoconiosis, provided concentrations of dust in the lung are sufficient and the virulence of the infecting organism is adequate.

Experimental Studies on the Toxicology of Benzene: Modifications of the Red Blood Cell Production (Erythropoiesis) Followed by Radioactive Iron. R. Truhaut,* C. Paoletti, M. Boiron, and M. Tubiana. Arch. mal. profess. 20:121-36 (Mar.-Apr.) 1959. (*Paris)

Effects of pure benzene, administered subcutaneously in olive oil (0.8 ml or 0.7 gm of hydrocarbon repeated 4 to 19 times) or by inhalation (6 mg/-liter, 8 hours a day, 6 days a week, for 30 to 125 days) on the erythropoietic system of rabbits were observed. Radioactive iron was used to follow iron metabolism. By following the tracer from the plasma to the red cells, where it is used in synthesizing hemoglobin, it is possible to divide the seemingly unpredictable effects of benzene into three categories: accelerated metabolism of iron from the plasma to the red-cell-forming tissue, resulting in apparent hyperplasia of that tissue; or the opposite—erythropoietic tissue hypoplasia; or a dissociation between disappearance of iron from plasma and appearance in erythrocytes. Thus, nonviable red cells are manufactured in the bone marrow.

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About the Authors

ASA BARNES, M.D., M.P.H., is chairman of the Industrial Medical Association's Committee on Medical Care. In this capacity he arranged panel discussions on the administration of medical care plans which were presented at the two latest IMA Annual Meetings. The group of articles on this general subject which are presented in this issue are for the most part taken from those programs. In addition to this service to the Association, DR. BARNES prepares the abstracts on medical care that appear in this journal.

DR. BARNES, a native of Missouri, received his M.D. degree from the University of Tennessee in 1931. After an internship at the U.S. Marine Hospital in New Orleans, he entered private practice in general medicine at Dexter, Mo., in 1932. In 1937 he took a position as district health officer in Missouri, and thereafter he became increasingly devoted to public health and medical administration.

He attended The Johns Hopkins School of Hygiene, from which institution he received the M.P.H. degree in 1940. He entered the Army in September, 1941, and was discharged with the rank of Colonel, his assignments having to do chiefly with infectious disease control in the Mediterranean Theatre of Operations and with administrative services in this country.

DR. BARNES is certified in public health by the American Board of Preventive Medicine, a Fellow of IMA, and an active committee worker in various organizations. He is Area Medical Administrator for the United Mine Workers of America, in Louisville. His is the lead article in this issue.

WILLIAM A. SAWYER, M.D., industrial medicine's great and distinguished dean, is author of the article "Labor's Health Goals" in this issue. The ideas and views expressed in this article are based upon a full lifetime of concern over the health problems of the working man. This began when DR. SAWYER became full-time physician to the American Pulley Company of Philadelphia in 1917. Two years later, in 1919, he joined Eastman Kodak Company as Medical Director, in which position for the next 32 years he developed a medical department that set the pace for the growth of industrial medicine. He retired from the medical directorship in 1951 because of his company's policy of compulsory retirement at age 65, but remained on as Medical Consultant for another two years. In 1953 he made a move that surprised his friends, yet should not have surprised them at all: he became Medical Consultant to the International Association of Machinists. The appointment was most fortunate for all of American medicine. His identification with the medical care programs of labor unions had a sobering effect upon those who were determined to see nothing but evil in the whole movement. His understanding council on the other side of the street most likely had an equally good effect.

DR. SAWYER has received all of the awards and honors one can get in industrial medicine. There is no need to list them here. We hope his writings will continue to grace our journal's pages for many more years.

DR. KENNETH E. MARKUSON has been Director of the Loss Prevention Medical Department, Liberty Mutual Insurance Company, Boston, Massachusetts since May 1, 1958. For six years before that he served as Division Medical Director for Liberty Mutual, with headquarters in Philadelphia.

Prior to joining Liberty Mutual DR. MARKUSON served for 11 years as Director, Division of Industrial Health, Michigan Department of Health, and two years as Director, Bureau of Industrial Hygiene, Connecticut State Health Department. From 1933 to 1935 he was employed as Medical Director, Ringling Brothers Circus. That organiza-

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About the Authors

tion experienced a severe and prolonged typhoid fever epidemic with more than 100 patients hospitalized throughout an area covering several Midwestern states. This experience stimulated his interest in public health and preventive medicine, a career he has followed since that time.

DR. MARKUSON holds the B.S. degree from the University of Nebraska (1927), the M.D. from Creighton University (1931), and the M.P.H. from The Johns Hopkins University (1936). He is now a lecturer at the Harvard School of Public Health.

DR. MARKUSON was President of the Michigan Industrial Medical Association in 1949-1950 and in the same year was President of the American Conference of Governmental Industrial Hygienists.

He is the author of several published articles in the occupational medicine field. He is certified by the American Board of Preventive Medicine and is a Fellow of the Industrial Medical Association. DR. MARKUSON'S article in this issue carries the engaging title "You're in Business—Big Business."

R. B. ROBSON, M.D., is author of the article in this issue entitled Windsor Medical Services, Inc. He graduated in medicine from the University of Toronto in 1916. After service with the Royal Army Medical Corps in World War I, DR. ROBSON established a general practice at Walkerville, Ontario. In the same year he assumed the medical directorship of General Motors of Canada on a part-time basis, and thereafter, in addition, provided industrial medical services for several small concerns.

DR. ROBSON has done postgraduate studies at the Toronto General Hospital. He is a past president of the Essex County Medical Society, a past chairman of the Industrial Committees of the Ontario as well as the Canadian Medical Association, and is Vice-President of the *Permanent Committee and International Association on Occupational Health.*

NICHOLAS I. KLIMOW, M.D. holds the double appointment in the Endicott Johnson Corporation of Chief of Preventive Medicine and Chief of Compensation Bureaus. He is the author of the article in this issue, "The Medical Care Plan of the Endicott Johnson Corporation."

DR. KLIMOW completed both the pre-medical and medical school courses at Syracuse University from which institution he received the B.A. degree in 1930 and the M.D. degree in 1933. After a year of internship at St. Margaret Memorial Hospital, Pittsburgh, he took additional training in obstetrics and pediatrics at Wilson Memorial Hospital, Johnson City. DR. KLIMOW began as a general practitioner in the Endicott Johnson medical care plan, and transferred to the trauma and compensation services.

In his war service he was Chief of Orthopedic Service at a station hospital in the South Pacific Area, and later Assistant Chief of Medical Services at Charleston (S. C.) General Hospital. As part of his present responsibilities DR. KLIMOW is Chief of Industrial Medicine at Wilson Memorial Hospital.

HALLETT A. LEWIS, M.D., is a native of Ohio. He received the A.B. degree from Hiram College in 1944 and the M.D. degree from the University of Cincinnati in 1946. An internship at Albany (N.Y.) Hospital was followed by two years of Army service in 1947-1949. He developed a general practice at Falmouth, Ky. during the next three years, and in 1952 returned to the University of Cincinnati for graduate studies. This institution awarded him the D.Sc. after successful completion of the three-year program in industrial medicine based at The Kettering Labora-

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tory. The in-plant (third year) component of this program was served at the medical department of the Procter and Gamble Company.

After a year as a member of the medical staff of the Ford Motor Company, DR. LEWIS in 1956 became Medical Director of Kaiser Steel Corporation at Fontana, Calif. He is author of the article in this issue entitled "Interrelation of the Industrial Medical Program of the Kaiser Steel Corporation and the Kaiser Foundation Health Plan.

JOHN D. WINEBRENNER, M.D., is Medical Director in the Knoxville Area of the medical services of United Mine Workers Welfare and Retirement Fund. This includes geographically the states of Tennessee and Virginia and the Southeastern part of Kentucky. He has held this position since the beginning of this program, in 1948.

DR. WINEBRENNER graduated from Ball State Teachers College, Muncie, Ind., with a B.S. degree in 1933 and received the M.D. degree from Indiana University in 1938. He served an internship and residency in the Indianapolis General Hospital and completed Master's degree work at the University of Michigan in 1941. He was employed by the Indiana State Board of Health until entering military service in 1942.

DR. WINEBRENNER served with the Military Government service in the European Theatre from Normandy to the occupation of Germany and later as Civilian Public Health Advisor for Enclave and Ports of Bremen, Germany, 1946-1948. He was decorated by both French and Belgian Governments. He is a specialist certified by the American Board of Preventive Medicine, a member of the American College of Physicians, and a Fellow of the American College of Preventive Medicine. He is a member of the American Public Health Association and of the Industrial Medical Association.

DR. WINEBRENNER is author of the article in this issue entitled "Interrelated Medical Care Plans in the Southern Appalachian Coal Fields."

JACOB CHOLAK, Ch.E., is the author of the topical review in this issue, "The Occurrence of Fluorine in Air, Food, and Water." For more than 30 years MR. CHOLAK has been associated with Kettering Laboratory of the University of Cincinnati. He began this relationship as a chemist in 1926 and progressed through successive faculty positions to Associate Professor of Industrial Health and Director of the Division of Industrial Hygiene Technology in the Department of Preventive Medicine and Industrial Health of the College of Medicine. MR. CHOLAK is widely known in those circles where there is an interest in the analytical methodologies of industrial health. He has produced 65 published articles in this field. In 1955 he received the Sixth Award as Eminent Chemist, from the Cincinnati Section of the American Chemical Society.

MR. CHOLAK'S college and graduate studies were done at the University of Cincinnati, from which institution he graduated as a chemical engineer. He is a registered professional engineer in the state of Ohio.

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People and Events

► ROBERT N. ARMEN, M.D., has been appointed Assistant Chief Physician for the Pittsburgh general office headquarters of United States Steel Corporation where he will be associated with JAMES C. HAYES, M.D., Chief Physician, according to an announcement by ROBERT B. O'CONNOR, M.D., Medical Director for the Corporation.

DR. ARMEN graduated from the American University of Beirut in Beirut, Lebanon and obtained his medical degree there in 1934. He served his internship at the American University School of Medicine Hospital, and came to the United States in 1940 on a fellowship in internal medical research at Johns Hopkins University.

Following a residency and assistant professorship in internal medicine at Cornell University, he served three years as a medical officer in the U.S. Army Medical Corps. Since 1946, he has been associated with various Veterans Administration hospitals, and has been Chief of Medical Services at the Veterans Administration Hospital in Clarksburg, West Virginia, since May, 1958.

DR. ARMEN is a Diplomate of the American Board of Internal Medicine; a Fellow of the American College of Physicians, the American College of Chest Physicians, and of the American College of Cardiology; and a member of the American Medical Association and the American Heart Association.

► BERT W. BROOKS, M.D., has become Director of Industrial Health Services for The Upjohn Company, Kalamazoo, Michigan. He was previously Medical Director of M and M Candies, a division of Food Manufacturers, Inc., Hackettstown, New Jersey.

DR. BROOKS received his B.S. degree in chemistry in 1947 from St. Peters College in Jersey City, and his M.D. degree from Jefferson Medical College of Philadelphia in 1952. Following internship at Mountainside Hospital in Montclair, DR. BROOKS entered private practice in New Jersey. Later he became medical consultant for Occupational Health Services, Inc., and for the Health Research Foundation of Asheville, North Carolina. He served as a Captain in the U.S. Air Force during World War II.

DR. BROOKS is a member of the Industrial Medical Association, the American Medical Association, and

Bert W. Brooks, M.D.

was chairman of the health maintenance committee of the Essex County (N.J.) Medical Society before moving to Michigan.

► THOMAS A. GARRETT, M.D., became Medical Director of Baxter Laboratories in Morton Grove, Illinois, as of September 1. He was previously Medical Director for Irwin, Neisler & Company, Decatur, Illinois.

DR. GARRETT received his B.A. degree from Villanova University in 1931 and his M.D. degree from Temple University in 1939. He interned at New York Foundling Hospital, New York City, and at Long Island College Hospital in Brooklyn. From 1942 to 1946 he served with the U.S. Army as Troop Transport Surgeon in the European and Asiatic theaters.

Following the war, DR. GARRETT joined Charles Pfizer & Company in Brooklyn, remaining there until 1954 when he came to Chicago with the J. B. Roerig Company. He did clinical research and medical service work for Roerig until 1956 when he joined Irwin, Neisler.

He is a member of the Industrial Medical Association, the World Medical Association, the American Medical Association, and the American Medical Writers Association.

► DONALD O. HAMBLIN, M.D., will become an independent consultant in the field of occupational health in January, 1960, upon his retirement as Medical Director of American Cyanamid Co. and subsidiaries.

DR. HAMBLIN received his medical education at the University of Virginia School of Medicine, and obtained his M.D. degree in 1929.

DR. HAMBLIN started with American Cyanamid in 1934 as Plant Physician for the Calco Chemical Division in Bound Brook, N.J. During his 26 years with American Cyanamid, he organized the company's medical program as well as the industrial hygiene and toxicology services.

A Fellow of the Industrial Medical Association, DR. HAMBLIN is one of the founders of the Industrial Medical Association of New Jersey, and twice served as president of this group.

► GLENN S. EVERTS, M.D., Medical Director of the Curtis Publishing Company of Philadelphia, and WILLIAM L. MACON, JR., M.D., Director of the W. L. Macon Medical Center of St. Louis, have been selected as members of the Medical Advisory Council of the American Association of Industrial Nurses. The Medical Advisory Council, composed of leading industrial physicians, counsels with the nursing group on matters concerning industrial nursing and assists in formulating statements of principles relating to the industrial medical and nursing professions.

DR. EVERTS, a Fellow and past member of the Board of Directors of the Industrial Medical Association, is a member of the American Board of Preventive Medicine, the Academy of Occupational Medicine, and the American Industrial Hygiene Association. He is also a member of the Board of Governors, Heart Association of Southeastern Pennsylvania, and Chairman of the Industrial Health Committee, Safety Section, Philadelphia Chamber of Commerce.

Among other professional groups, DR. MACON is a member of the Industrial Medical Association, American College of Surgeons, Aerospace Medical Association and the Airline Medical Examiners Association.

► N. GILLMOR LONG, M.D., has been assigned as Reserve Deputy Surgeon of the Fifth Army. DR. LONG is Medical Director for Lumbermens Mutual Casualty Company in Chicago, and is chairman of the Workmen's Compensation Committee of the Industrial Medical Association.

► An International Ergonomics Association, with headquarters in Zurich, Switzerland, has been formed for the purpose of bringing together individuals and organizations concerned with development and application of scientific biological knowledge related to optimal utilization of human capacities in work. Involved are the human work scientists, in physiology, psychology and anatomy, and the users, industrial physicians and engineers as well as organizations representing management and labor. The Association is intended to further two types of communication: between scientific disciplines and between science and industry, both on an international basis.

The organizing committee consists of G. C. E. BURGHER (Eindhoven, Holland), Chairman; K. U. SMITH (U.S.A.), Treasurer; H. S. BELDING (U.S.A.); G. LEHMANN (Dortmund, Germany); N. P. V. LUNGREN (Stockholm, Sweden); B. METZ (Strasbourg, France); and R. G. STANSFIELD (London, England). DR. SMITH is Professor of Psychology at the University of Wisconsin, and DR. BELDING is Professor of Environmental Physiology in the Department of Occupational Health, Graduate School of Public Health, University of Pittsburgh.

► Northwest Association of Occupational Medicine will hold its annual meeting at the Hotel Multnomah in Portland, Oregon, on September 27. The scientific pre-

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People and Events

sentations are as follows: "Industrial Dermatoses"—DONALD J. BIRMINGHAM, M.D., Chief Dermatologist, U.S. Public Health Service; a symposium on age changes in the human mind, including: "Measurement of Intellect"—GLENN R. HOUDE, Vice Principal, Woodrow Wilson High School, Portland; "Behavioristic Variations Related to Age"—JOHN L. BUTLER, M.D., Assistant Professor, Department of Psychiatry, University of Oregon Medical School; "Cerebral Vascular Insufficiency"—KENNETH E. LIVINGSTON, M.D., neurosurgeon; "Barriers to Understanding"—HEROLD LILLYWHITE, Ph.D., Director, Speech and Hearing Clinic, University of Oregon Medical School.

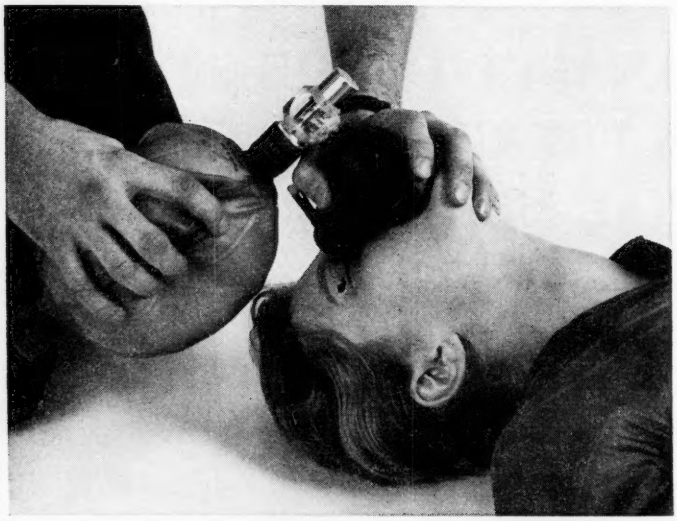
The afternoon session will include: "Teamwork in Industrial Toxicology"—ROBERT E. ECKARDT, M.D., Medical Director, Esso Research and Engineering Company; "Case Presentations of Problems with Paraplegia, Dermatoses, Noxious Chemicals and Metals"—a panel discussion by WALTER H. POPPE, Industrial Hygiene Engineer, Boeing Airplane Company; M. CHAIN ROBBINS, Chemist, Boeing Airplane Company; and Drs. DONALD J. BIRMINGHAM, ROBERT E. ECKARDT, RALPH R. SULLIVAN and ARTHUR C. JONES.

► The Sixth Annual Pacific Northwest Industrial Health Conference will be held September 28-29 at the Hotel Multnomah in Portland, Ore.

The keynote address by ARVID S. ANDERSON, Director of Personnel Administration, Champion Paper and Fibre Company, is entitled "How Much Should Industry Do Toward Health Maintenance?" At a luncheon meeting, W. GORDON YATES, McCormick and Company, will speak on "The Older Worker."

All other sessions will be panel discussions. Subjects to be covered are: "The Impact of the Growing Number of Older People on Our Economy," and "Do Health Maintenance Programs Reduce Absenteeism?" Participants in these discussions will be KEEN JOHNSON, Vice President of Public Affairs, Reynolds Metals Co.; DONALD J. BIRMINGHAM, M.D., Chief Dermatologist, U.S. Public Health Service; EWAN CLAGUE, Commission of Labor Statistics, U.S. Government; THOMAS W. NALE, M.D., Medical Director, Union Carbide Corp.; CHARLES R. BECHTOL, Personnel Director, Kenworth Motor Truck Co.; LLOYD BERTRAM SHONE, M.D., Captain, Medical Corps, U.S. Navy; R. E. ECKARDT, M.D., Ph.D., Medical Director, Esso Research and Development Co.; ELISABETH S. BIRD, Medical Department Manager, Frederick & Nelson; ROBERT H. LITTLE, Actuary and Partner, Coates, Herfurth and England.

► Third Annual Western Industrial Health Conference will be held at the Statler Hotel in Los Angeles on October 2 and 3. The scientific program follows: "Practical Medical Management of Cardiacs in Industry" — JOSEPH ROSNER, Ph.D., WALLACE G. FRASHER, M.D., and ROBERT STIVELMAN, M.D.; "Stress, Work, and Personality" — RALPH COLLINS, M.D., with discussion by JEAN FELTON, M.D., MARVIN KLEMES, M.D., and R. T. JOHNSTONE, M.D.; "Air Pollution and Health" — a panel discussion by BERNARD D. TEBBENS, Moderator, RICHARD A. PRINDLE, M.D., W. L. FAITH, Ph.D., and MALCOLM MERRILL, M.D.; "Industrial Health in the Space Age"—a panel discussion by JAMES RYAN, M.D., Moderator, LAURENT LA ROCHE, M.D., JOHN GARRISON, Capt. MARY S.



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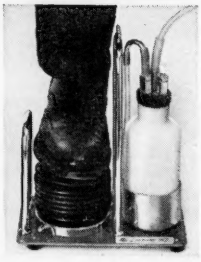

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The various sponsoring organizations will hold concurrent specialty group meetings. The Western IMA will feature three presentations as follows: "Reaction of Joints to Trauma"—VERNON LUCK, M.D.; "Repair of the Windshield Injury" — SALVADOR CASTANARES, M.D.; and "Whiplash!"—DERWYN SEVERY and ARNOLD SIEGEL. The Western Industrial Nurses Association will hold a panel discussion entitled "The Program Depends on the Players." The American Industrial Hygiene Association will hold a panel discussion on "Living with Ionizing Radiation."

► The Industrial Medical Association of Pittsburgh will meet September 18 at the Mellon Institute. The program theme will be: Occupational Medicine, Past and Future.

D. JOHN LAUER, M.D., President, will be moderator of the morning session which will include three presentations: "Historical Development of Industrial Medicine in Western Pennsylvania"—J. HUBER WAGNER, M.D., first President of the IMA of Pittsburgh; "Problems in Man-Space Flight" — EDWARD HIATT, M.D., Ph.D., Chief of Biophysics, Wright-Patterson Air Base; "Mental Health Programming: A Challenge for the Physician"—KENNETH J. MUNDEN, M.D., The Menninger Foundation.

D. V. DOUGHERTY, M.D., President-Elect, will be the moderator of the afternoon session. The two presentations scheduled are: "Radiation Hazards in Industry"—ALBERT A. SPRITZER, M.D., Clinical Associate Professor of Occupational Medicine, University of Pittsburgh and Medical Director, Westinghouse Waltz Mills Material Testing Reactor; "Clinical Uses of Radio Isotopes"—JOHN P. STORAASLI, M.D., Associate Professor of Radiology, Western Reserve University.

► The New York State Society of Industrial Medicine will meet at the Waldorf Astoria Hotel in New York City on September 30. The general theme of the scientific program is "The Treatment of Pain Syndromes Commonly Encountered in Industry." The speakers and their subjects follow: "The Physio-Dynamics of Pain"—HERBERT KUPPERMAN, M.D., Associate Professor of Medicine, New York University - Bellevue Medical Center; "Headache" — ARNOLD P. FRIEDMAN, M.D., Attending Physician, Neuropsychiatry and Physician in Charge, Headache Clinic, Montefiore Hospital, and Associate Professor of Clinical Medicine, Columbia College of Physicians and Surgeons; "Dysmenorrhea" — MARTIN L. STONE, M.D., Attending Physician and Director, Obstetrics and Gynecology, Flower-Fifth Avenue and Metropolitan Hospitals, and Professor and Director of Obstetrics and Gynecology, New York Medical College; "Painful Shoulder Syndrome"—ROBERT L. FRANSWAY, M.D., Physician in Charge, Wayne Assembly Plant, Ford Motor Company; "Back Pain"—KALMAN FRANKEL, M.D., Clinical Assistant, Neurology, Jefferson Hospital and Assistant Professor, Clinical Neurology, Jefferson Medical College of Philadelphia.

► The Annual Industrial Medical Conference of Ontario and Quebec will be held at The Chantecler in Ste-Adele-en-haut, Quebec on October 14 through 16. The papers to be presented are: "Measurements of Cardiovascular Diseases in One Company"—DONALD C. BEWS, M.D., Medical Director, Bell Telephone Company of Canada; "Follow-Up Reports on Acute Myocardial Infarction in Industrial Workers"—PETER VAUGHAN, M.D., Medical Officer in Charge of Examinations, Canadian National Railways; "The Cardiac in Industry"— E. A. STEWART REID, M.D., Associate Director, Cardio-Respiratory Laboratories, Montreal General Hospital; "Practical Methods of Reducing Skin Disease in Industry"—GIBSON E. CRAIG, M.D., Dermatologist, Royal Victoria Hospital; "Opportunities in the Field of Mental Health in Industry"—ALASTAIR W. MACLEOD, M.D., Assistant Director, Mental Hygiene Institute of Montreal; "Effect of Psycho-active Drugs on Working Capacity"—HEINZ E. LEHMAN, M.D., Clinical Director Verdun Protestant Hospital; "The Arvida Placement Scheme"—FRANK D. BRENT, M.D., Medical Director, Aluminum Company of Canada; "Medico - Legal Aspects of Industrial Medicine"—P. C. VENNE, Assistant General Counsel, Bell Telephone Company of Canada; "Evaluation of Diagnostic Procedures for Detection of Tuberculosis in Industry"—HUGH E. BURKE, M.D., Medical Director, Royal Edward Laurential Hospital; "Traumatic and Gouty Arthritis in Industry"—J. ANTOINE BLAIS, M.D., Associate Professor, University of Montreal; "Rehabilitation in Industry"—GUSTAVE GINGRAS, M.D., Medical Director, Rehabilitation Institute of Montreal.

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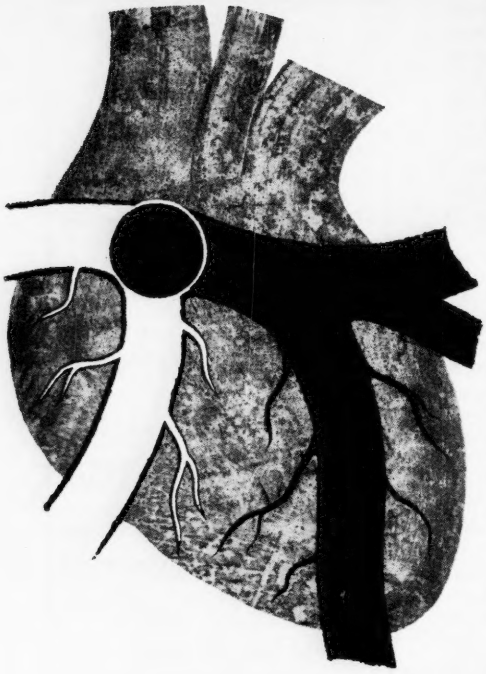

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—Early Management of Myocardial Infarction: B. E. Pollock; Journal of the American Medical Association, 161:404 (June) 1956.

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